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TECHNOLOGY FOR HIGHER EDUCATION

DECEMBER 2003 • VOL. 17, NO. 5 • WWW.SYLLABUS.COM

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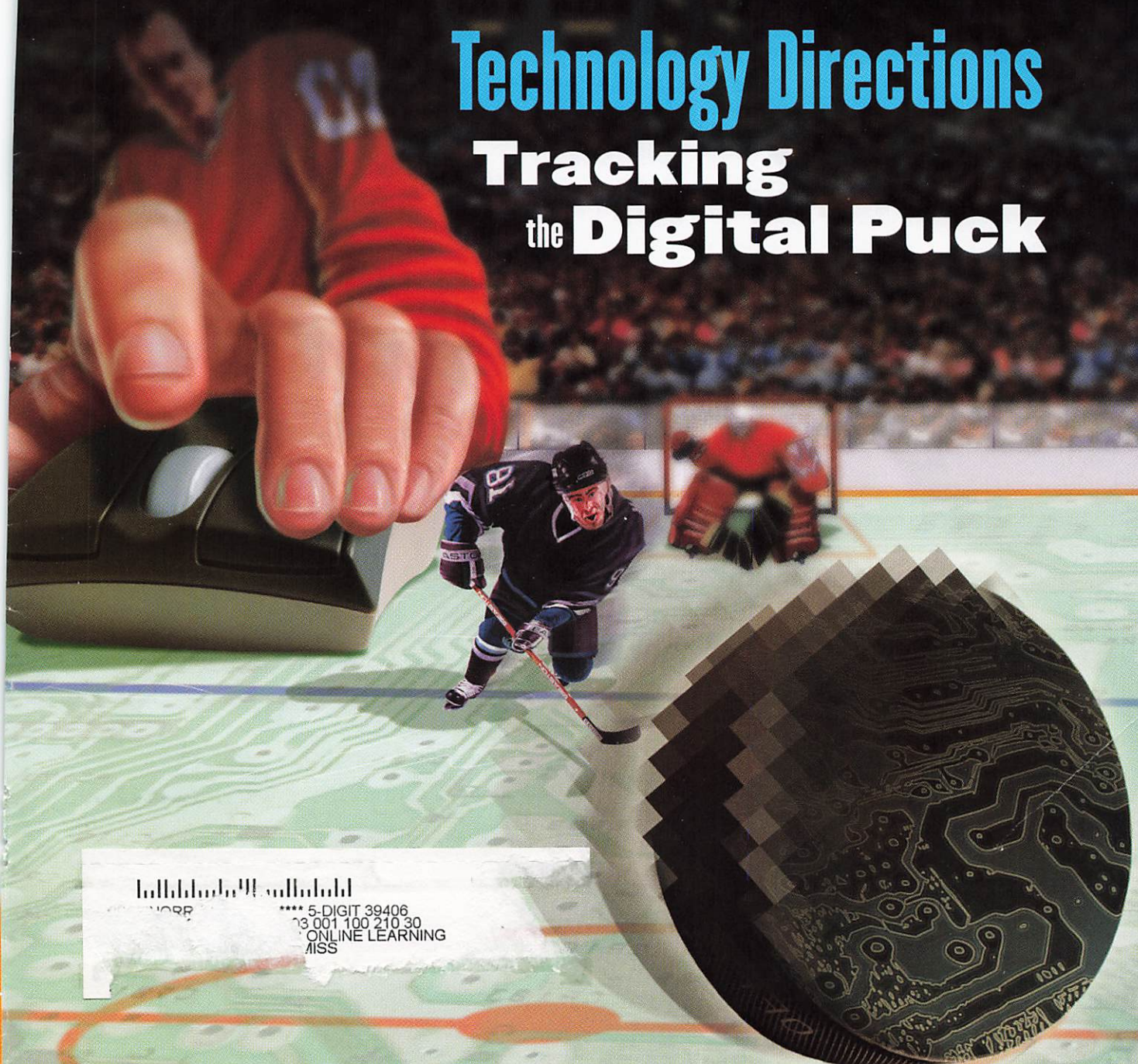
Technology Directions

Tracking the Digital Puck



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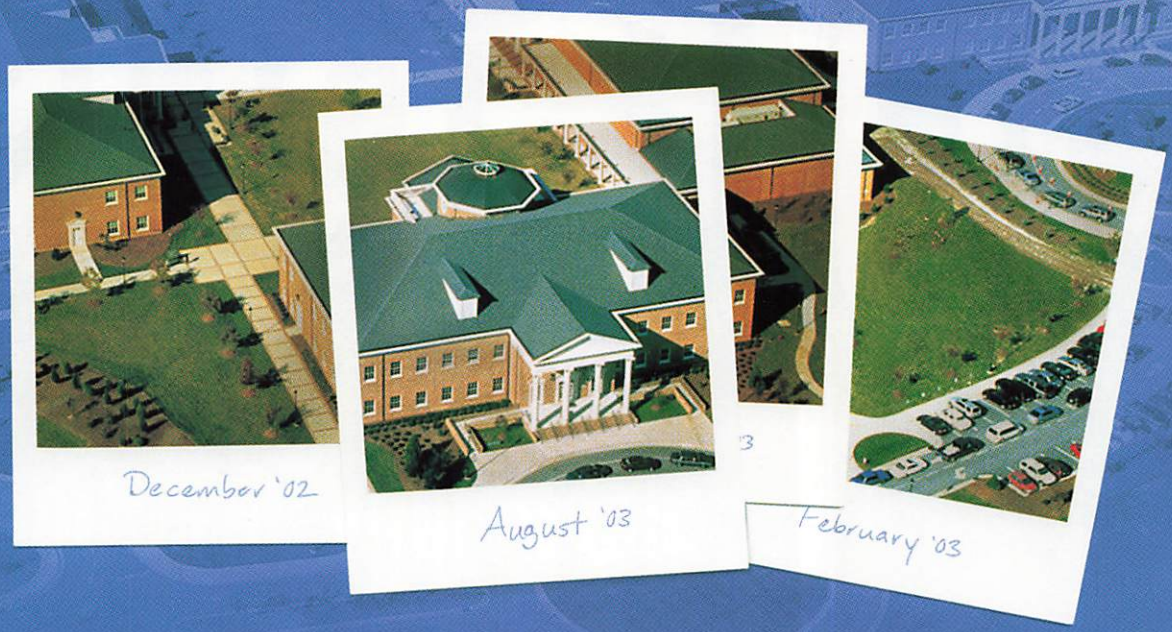

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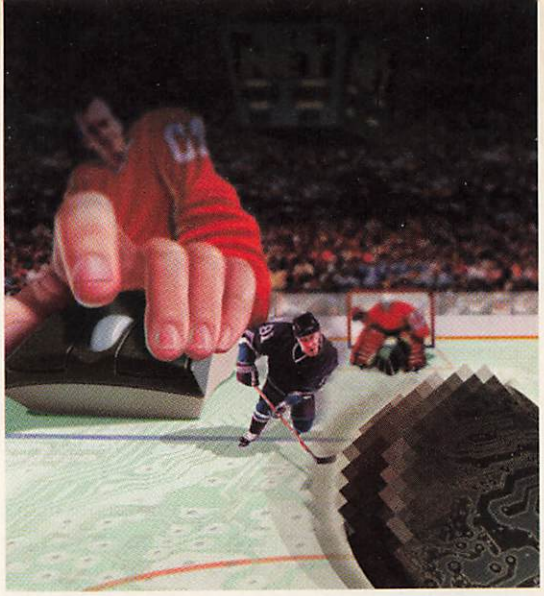

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EDITOR'S NOTE

Mary Grush, Editor

This year's annual Buyer's Guide issue is packed with information about technology products and services for the campus. While it's not possible within this space to present a comprehensive listing of the hundreds of hardware devices and software applications available to higher education purchasers, we've selected several important products in each of eight key technology areas in order to offer readers a convenient and useful guide (beginning on page 14).

Of course, technology selection is more than creating a wish list of impressive choices. How will you make good decisions that reflect not only your own institution's goals, requirements, and resources, but also consider technology directions and broader trends in higher education? In our lead feature, "Tracking the Digital Puck into 2004" (page 10), Casey Green draws on 14 years of data from the Campus Computing Project, the longest-running study of technology in higher education, to give readers a sense of "where the puck is going." The study provides insight into important trends in areas like wireless, course management systems, services on the Web, and content and intellectual property issues. Casey makes an interesting observation about the shifting priorities of higher ed IT—respondents have placed a growing emphasis on areas like IT financing, ERP, and wireless while keeping their single highest priority of "assisting faculty to integrate technology into instruction." Casey characterizes this as "...not so much a declining importance of instructional integration as a rising priority of the other [IT] issues..." I'd suggest that it also shows us that the widespread adoption of technology has placed more of the technology decision making at an institutional level. And I'd say that those decisions are made in light of the institutional mission of teaching and learning...keeping instructional integration high on the list of priorities for IT.

In his Trends column, Phil Long considers "What to Look for in '04" (page 6). He points out that it's not a particular product that will stand out as the 'next big thing' in 2004, but the thinking surrounding hardware and software development—Phil examines what's behind development and adoption in selected technology areas. And Reflections columnist Howard Strauss thinks ahead about "The Best IT Products of 2007" (page 42). Could Howard's predictions be the trends we'll be covering in *Syllabus* in about four years?

I'm pleased to announce our very first blogger on the Syllabus Web site. Casey Green's Digital Tweed Blog is now live on the Web. Casey will offer his views on technology in higher education in the spontaneous, free form of online journaling. Visit www.syllabus.com/blog.

January 5 is the due date for proposals for Syllabus2004, our annual summer conference, to be held in downtown San Francisco July 18-22, with a special day planned across the bay on the University of California-Berkeley campus. Consider responding to the Call for Papers on page 38, or on our Web site at www.syllabus.com/cfp.

Enjoy this issue of *Syllabus!*

Mary Grush

Letters to the editor should be addressed to the editor and sent to 101 First Street, #605, Los Altos, CA 94022, or via electronic mail (mgrush@syllabus.com). We reserve the right to edit all submissions. **News and product information** will be considered for publication. Please send all materials to Paul McCloskey. If you are interested in writing for *Syllabus*, please send a brief description of your article idea along with writing samples to the editor at the above address.

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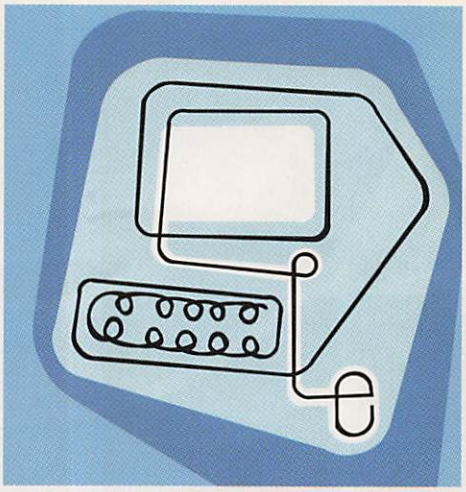
Phillip D. Long

TRENDS

AN INFORMATION RESOURCE OF INTEREST TO EDUCATORS

What to Look for in '04



The most striking thing about the current trends in technology, as this issue will catalog in detail, is that the 'next big thing' doesn't leap from the pages, at least not as a product. That's not to say that there aren't some really cool developments in technology gadgets, some of which might well enhance teaching and learning. But the biggest trend isn't in gadget-land. It's in the thinking behind software and hardware development that the developers are adopting. So let's look at some of this year's trends that may help you anticipate what's coming in the next year.

Computers

Moore's Law continues its relentless course. In the fall of 2003, with the introduction of the Apple G5 desktop, advances the stakes once again in comparisons of raw performance. Virginia Tech took delivery of the first 1,100 of these high-performance machines and for a fifth of what it would otherwise have cost—linked them together into a multi-terraflop supercomputer. Benchmarks have yet to be published, but expectations predict it will jump into the ranks of one of the top five among supercomputing machines worldwide.

The power trend is complimented by the weight and size, namely *lighter* and *smaller.* However, we're rapidly reaching the point where you need to look carefully at the design and features, not just the specifications, to make an intelligent buying decision. What once were trade-offs for sub-notebook convenience is no longer as obvious. Sub three-pound notebooks are full featured (or nearly so) and becoming common from mainstream vendors like Toshiba, Dell, and Gateway, just to name a few.

Floppy Disks (Bye-Bye!)

Of course, the one trade-off is saying good-bye to the floppy disk drive. For my money, that couldn't come soon enough anyway. Why do you need it? USB key drives, compact flash cards that slip into PCMCIA card frames, MMC, and Memory Sticks have long surpassed the capacity of the aging floppy disk. They're becoming the solid state storage coin of the realm. I haven't been to a conference in the past year where it wasn't possible to slip my presentation or give notes and reports to others by copying them onto my keychain USB drive and popping it into the destination machine. Capacities of a gigabyte are common, with the pricing sweet spot in the 256MB to 512MB range.

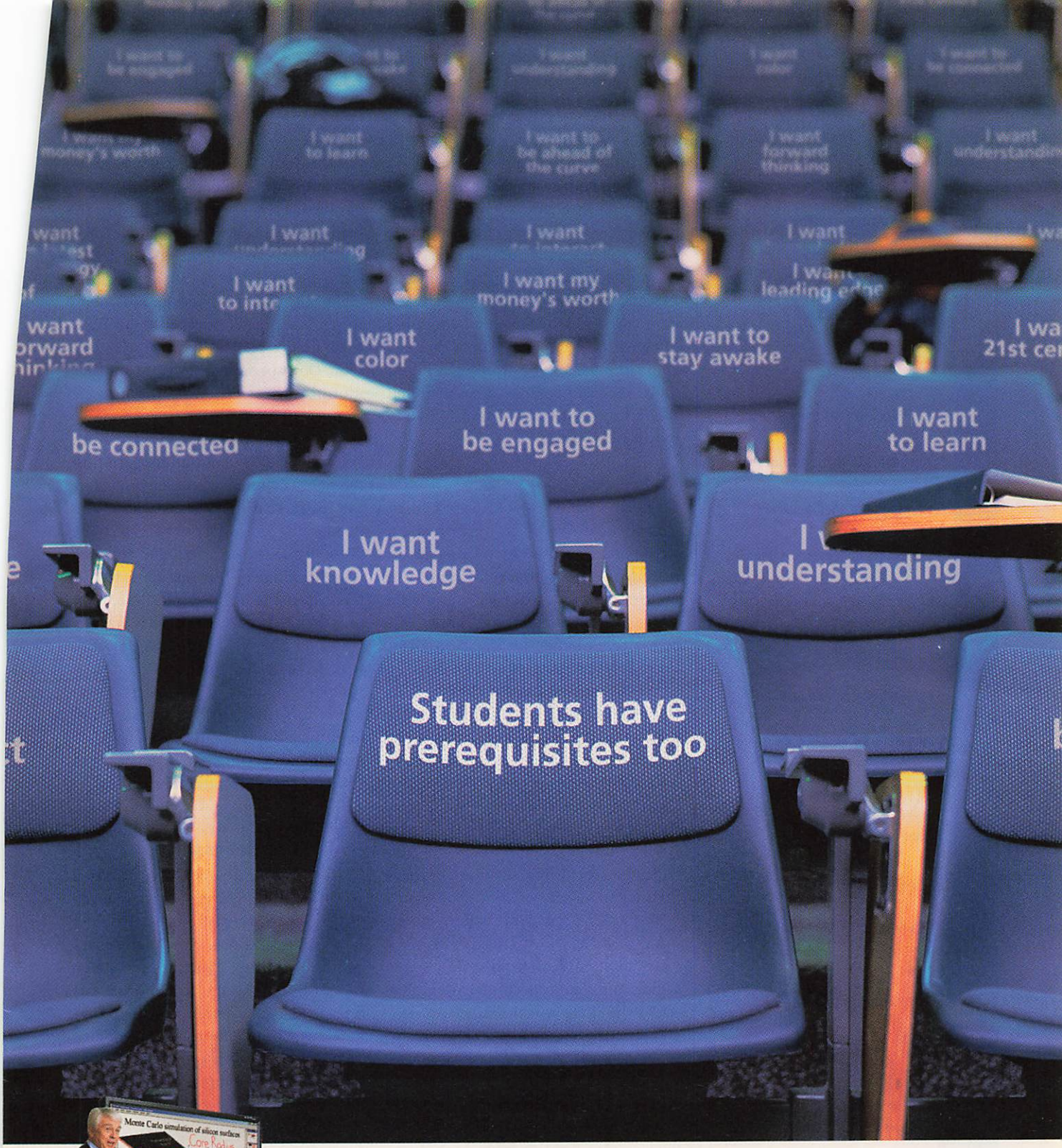
Bluetooth

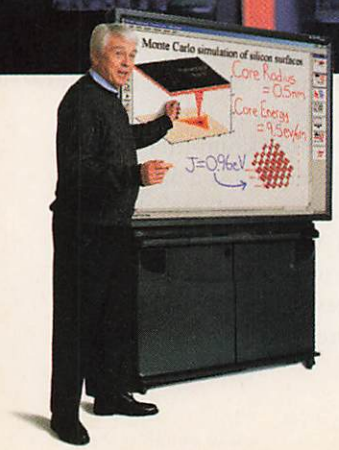
It's finally coming of age. Look for small inkjet printers with Bluetooth support to ease wireless printing from laptops with this added default feature. The driving force behind this short-range communications technology is, ironically, the cell phone and Personal Digital Assistant. Increasingly, cell phones are becoming an alternate pathway to the Internet, with the connection made between the phone and computer via Bluetooth. Similarly, synching PDAs with the computer is becoming wireless. Docking stands may well become relics of a tethered past, quaint reminders of when we had to actually physically connect devices to communicate with them.

Tablet PCs

These devices are evolving, providing better performance and marginally better screen resolution with each successive generation. They are finding niches where the pen interface adds value. But they have not exploded into the marketplace as the vendors had hoped.

There's good reason for that. While there may be a generation effect retarding their spread, the fact is the current computer generation has grown up learning to type, facile with the limitations of that interface. Hand-





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writing recognition is improving, but typing is simply faster. While there is a learning curve for keyboard comfort, the penmanship of the average student isn't something handwriting recognition will likely conquer anytime soon, intelligent agents or not. The pen interface shines where expression isn't romance language dependent. Hence, the slate tablet is likely to remain a niche tool, with the clamshell keyboard and tablet design continuing for some time to come. Think carefully about the places you think you might find a keyboard useful—carrying around the extra weight and additional piece to have it at the ready.

PDAs

Personal Digital Assistants are adding thumb keyboards, communication capabilities, and device integration (through support of various card form factors and small but very readable screens). Their usefulness is limited less by their CPUs than the curse of portability at all costs. Their ecological niche in the digital landscape has always been the pocket. As personal information managers, they've exploited that niche well. Forays into other habitats, hybridizing with phones, sprouting camera appendages, and music players has added genetic diversity to the species, though whether these will lead to longer term hybrid vigor beyond their initial novelty remains to be seen.

In the K-12 space, PDAs have carved out a niche as a cost effective productivity tool. Folding keyboards, Pocket Office, and data collection sensors that make the little workhorse a versatile addition to any science lab. PDAs are the little computers that could. What's next? If you aren't pushing for interface connectors like USB ports, and full external XGA video support for these devices, you need to raise your voice. Imagine unfolding your pocket keyboard, plugging your PDA into a full size flat panel monitor or video projector and firing up your browser to go to work. That may not be possible from among the selection in this year's buyer's guide, but it isn't far off if the market wants it. And remember, you are the market.

Display Devices

Projectors are getting smaller (isn't everything?) and brighter. Monitors with those throwbacks to the dawn of television, the CRT (cathode ray tube) are history. Don't buy them, even if you find them. They are hard on the eyes, less energy efficient, and don't hold a candle to the sexy sleek thin flat panel displays that are supplanting them from the display device ecosystem. Apple has already dropped them from their future plans. Everyone else will soon. Don't be seduced by close out CRT monitor prices. They are the Jurassic gasps of a passing era.

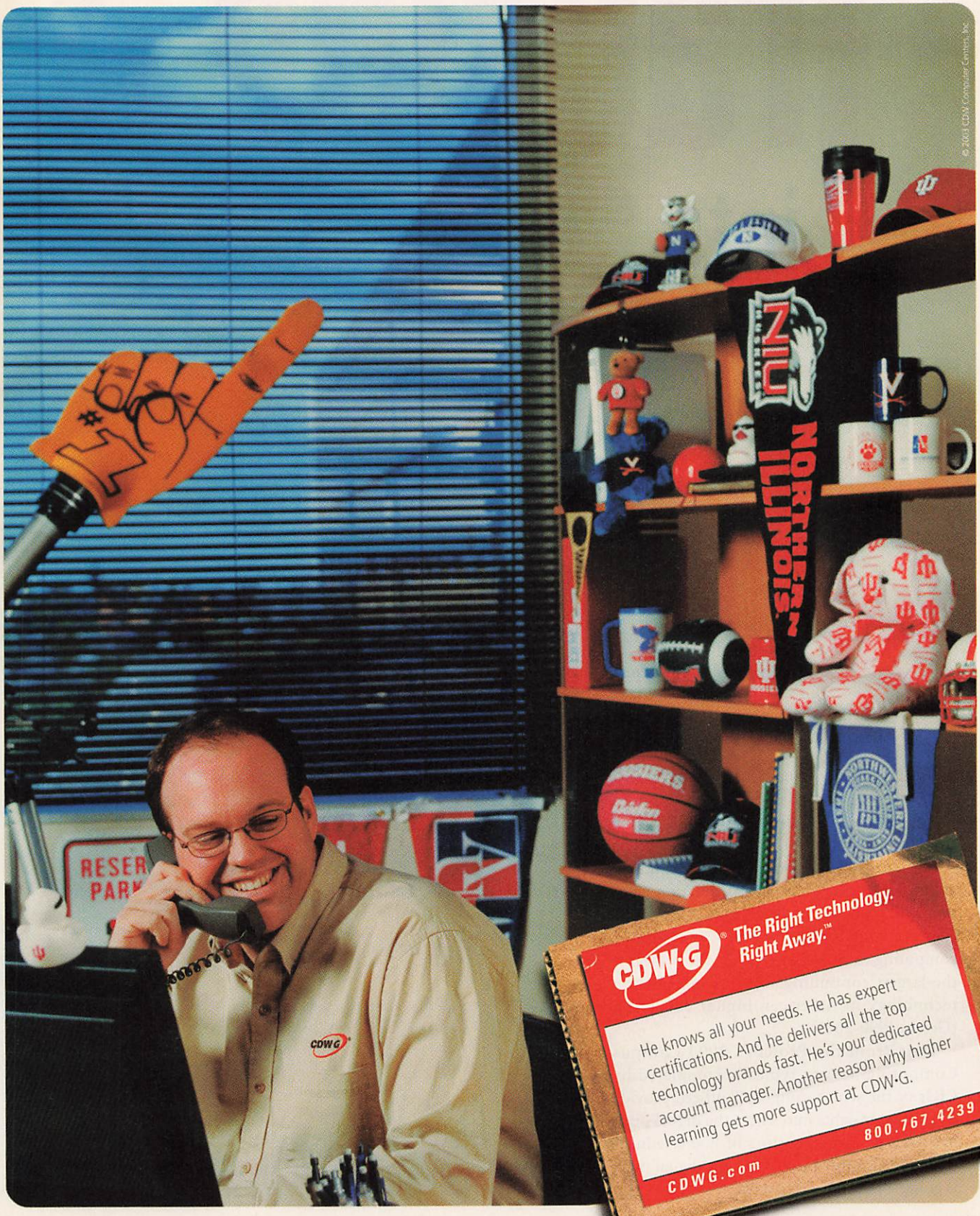
Flat panel computer monitors are getting bigger! Finally, an exception to the rule! They are challenging projectors for those seminar rooms where you need a shared display space but the noise of the projector fan and securing it to the ceiling or rear wall starts to cost more than the device itself. Resolution of 1024 x 768 makes the display actually readable. There continues to be issues with larger plasma displays for use as computer monitors. Still images left to burn into their displays present big liabilities. But LED displays and LCD displays are getting better, bigger, and cheaper. That's a good combination.

Capture, Display, and White Boards

Combination devices are worth a second look such as: white board/display/touch screen from SmartBoard, PolyVision, and 3M. Now that they're adding IP addressability, a partial step toward the connection conundrum has been made. Let's decompose that statement, as I heard the rushing sound of "what?" escaping from your virtual lips. Consider what we might call the Laptop Switch Dance—the bane of trying to switch between shared display devices, connecting them to the single device that needs to use them. Unless you've got a fixed podium computer in the classroom, how many of you have struggled through the projector-laptop switch dance? You know the one. Your students have projects to present to the class that they've dutifully labored over for the past three weeks.

continued on page 38

> **2:56 pm.** With his extensive tech training, CDW·G account manager Chris Clark supports higher learning every way he can.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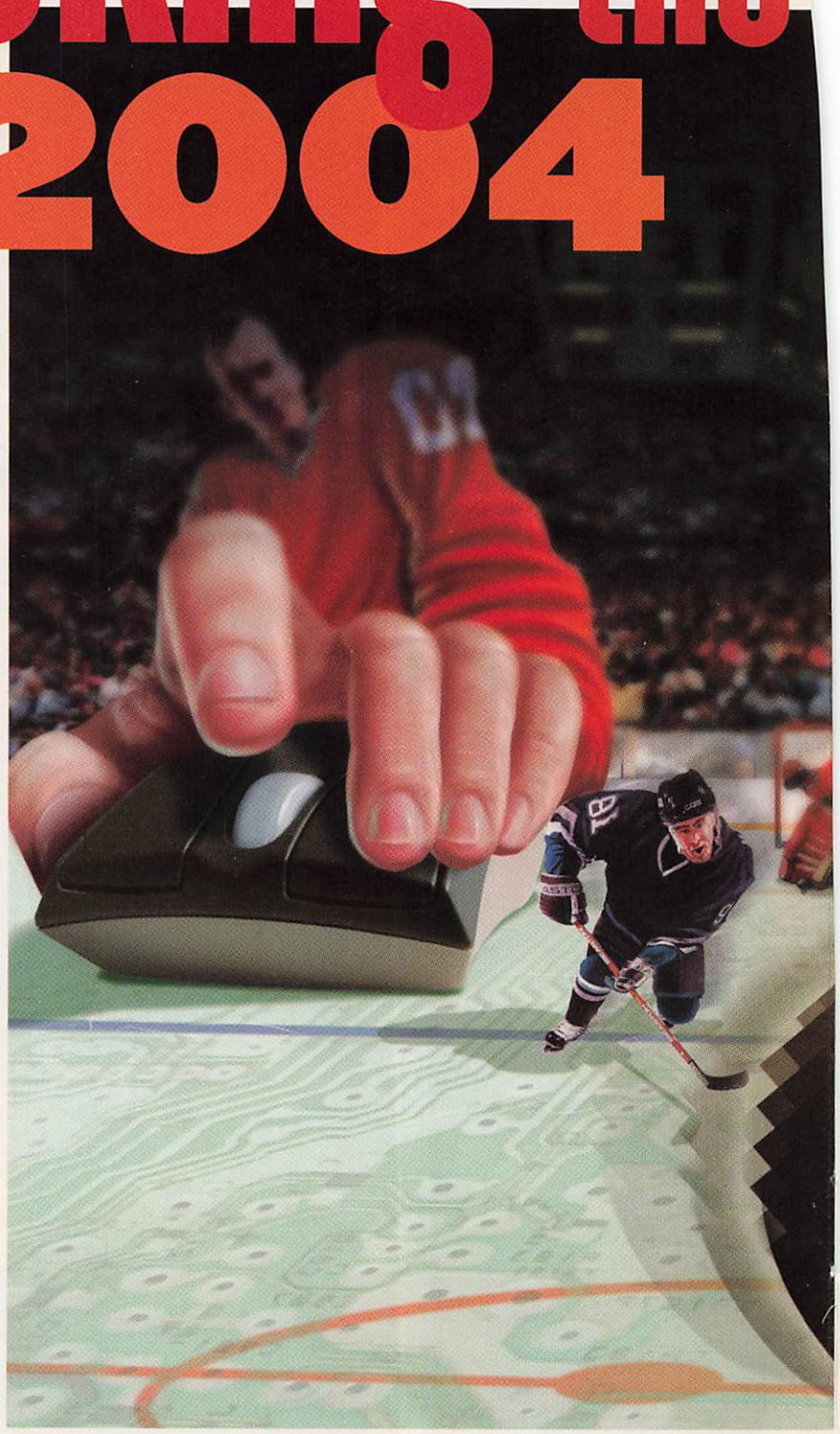
Tracking the into 2004



"Legend has it that when Wayne Gretsky was asked why he was so successful as a hockey player he responded by saying that he always tried to skate to where the puck was going to be, not to where it was.

The notion of a 'digital puck' as a metaphor for information technology in higher education seems appropriate: Sometimes the puck moves very fast, sometimes slow; and its movement is often erratic. Moreover, there are lots of people and institutions that always seem to be chasing the puck—sometimes going to where the puck was, sometimes tying to anticipate where the puck is going."

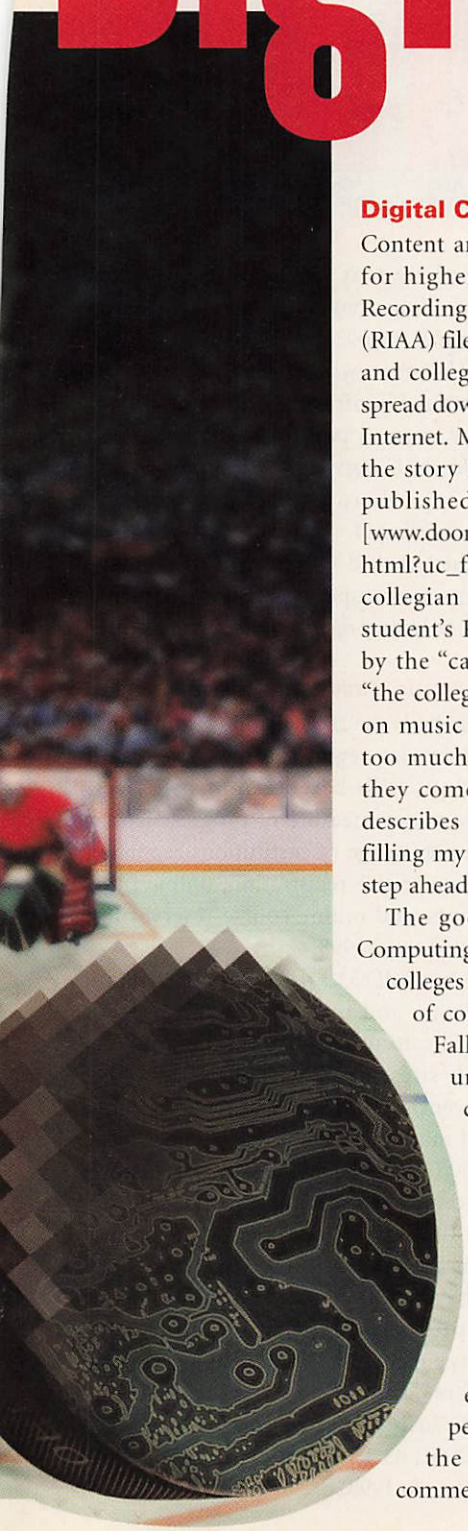
—"Tracking the Digital Puck" Kenneth C. Green, Syllabus magazine, December 2002

This article extends the "digital puck" metaphor that first appeared in *Syllabus* in December 2002 ("Tracking the Digital Puck"). Then as now, a continuing source for information about the "digital puck" of information technology in American higher education is The Campus Computing Project (www.campuscomputing.net). Begun in 1990, the project is the largest continuing study of information technology in American higher education (Green, 1990-2003).

Data from the Project's 2003 Campus Computing Survey, typically completed by CIOs or the senior campus IT officer, provide interesting insights into where the digital puck has been in various sectors of higher education, and also the direction of the digital puck is going—in 2004 and beyond.

Digital Puck

By Kenneth C. Green,
The Campus Computing Project



Digital Content on the Internet

Content and copyright have been big issues for higher education this past year. The Recording Industry Association of America (RIAA) filed law suits against college students and colleges in an effort to stem the widespread downloading of digital music from the Internet. Music on the Internet was the also the story line for the *Doonesbury* cartoon published on Sunday, January 12, 2003, [www.doonesbury.com/strip/dailydose/index.html?uc_full_date=20030112], follows one collegian who asks if he can use a fellow student's PC: his computer was confiscated by the "campus computer police" because "the college is really starting to crack down on music piracy...if they see you're using too much bandwidth on the main server, they come looking for you." The student describes himself as a "gypsy downloader, filling my MP3 player wherever I can, one step ahead of the man."

The good news from the 2003 Campus Computing Survey is that the majority of U.S. colleges and universities have campus codes of conduct that address this issue: As of Fall 2003, eighty percent of American universities, two-thirds of four-year colleges, and half of community colleges have campus policies intended to stem the unauthorized downloading of commercial content—primarily music and movies—from the Internet.

Other data from the 2003 survey reflect the campus commitment to protecting copyright. For example, almost all campuses (92.3 percent) have policies intended to stem the unauthorized duplication of commercial software; similarly about nine-in-ten (87.4 percent) have codes of conduct regarding the fair use of copyrighted content such as books and journal articles.

Indeed, the 2003 survey data confirm that colleges and universities are making significant efforts to respond to the concerns of media industry officials regarding the unauthorized distribution and downloading of music, video, and other commercial content on campus networks. And while not condoning the behavior of students who download music and film, it is also clear that college students—and colleges—have become an easy target for the entertainment industries. For example, although growing numbers of consumers—upwards of some 16 million households—now have access to high-speed networks from home, entertainment industry groups that are understandably unhappy about the proliferation of digital content on the Internet continue to focus on college students as the primary culprits for downloaded content because they represent a large, easily identifiable and easily targeted population. In fact, the notion that all 16 million American college students, ages 17-67, are "wired" is one of the major myths of the Internet: At best the "wired" population—those students with 24/7 access to high-speed campus networks—totals some 1.8 million undergraduates, the students fortunate enough to live in campus dorms.

In contrast, consumer broadband providers—ISPs, cable, and telephone companies including Adephia, AOL, Comcast, Earthlink, and SBC—are far less conscientious about addressing copyright issues with their clientele than are colleges and universities that provide e-mail accounts and Web access for their students, faculty, administrators, and staff.

More Wireless

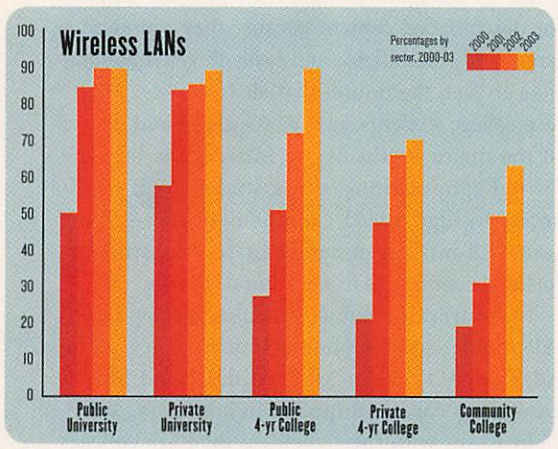
The 2003 survey data reveal some dramatic gains over the past year regarding campus planning for

Illustrated by Mick Coulas

and the deployment of wireless networks (WiFi). Almost four-fifths (77.2 percent) of the campuses participating in the 2003 survey report wireless LANs, up from two-thirds (67.9 percent) in 2002 and 29.6 percent in 2000. Although most universities had some wireless LANs operating by 2001, the big gains for WiFi on campus in recent years have been among four-year public colleges and community colleges, where WiFi deployment almost doubled between 2001 and 2003.

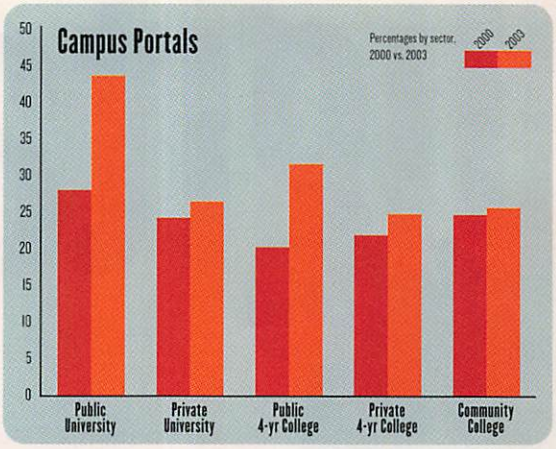
Other data mark the continuing expansion of WiFi services. For example, a seventh (14.2 percent) of the participants in the 2003 survey indicate that full-campus wireless networks are up and running at their institutions as of Fall 2003, compared to a tenth (10.0 percent) in 2002 and just and 3.8 percent in 2000. Across all sectors, the 2003 data suggest that wireless services cover more than a quarter (27.4 percent) of the campus at institutions reporting wireless networks, compared to less than a fifth (18.3 percent) in 2002 and just 10.9 percent in 2001.

However, even as WiFi grows, many institutions seem to have opted for a "just do it strategy," focused on deployment first, followed by planning. The



proportion of campuses reporting strategic plans for wireless networks rose to 45.5 percent in Fall 2003, up from 34.7 percent in 2002 and 24.3 percent in 2001. The numbers with plans as of Fall 2003 trail the numbers of campuses with some WiFi deployment (77.7 percent vs. 45.5 percent).

WiFi service may be a victim of its own success for many institutions, despite explosive growth of wireless on campuses and in the consumer and corporate sectors. Rising expectations about wireless services are fostered in part by the recent, dramatic growth of inexpensive WiFi in the consumer sector. Students and faculty may come to campus wondering why there is no wireless service in dorms, offices, classrooms, and the campus quad if they already have WiFi at home.



Progress on Portals

American colleges and universities are making steady progress in developing and deploying campus Web portals. The 2003 survey data document the growing number of institutions that now have Web-based campus portals, up to 28.4 percent in 2003, from 21.2 percent in 2002.

Another fifth (20.4 percent) of the survey respondents report that the campus portal is "under development" or being installed in the current academic year, about the same as in 2002. Just under a fourth (24.5 percent compared to 29.5 percent in 2003) of the participating campuses indicate that portal issues are now "under review/discussion" at their institutions, while a slightly higher proportion (27.4 percent) report no portal planning or related activities at their institution (compared to 29.0 percent in 2002).

Other data from the 2003 survey also reflect the campus commitment to Web portals. For example, a third (31.3 percent) of the institutions participating in the 2003 survey have a strategic plan for portal services, up from 24.9 percent in 2002. Survey respondents rate "providing a campus portal for Web-based student services" at 5.7 (scale: 1=not important; 7=very important), up from 5.5 in 2002, and 5.2 in 2000.

However, when asked to assess the campus IT infrastructure, respondents rank campus portals lowest among 13 different IT services (a 2003 portal score of 3.1, where the scale is 1=poor; 7=excellent). In contrast, the two highest-ranked IT infrastructure components are computer networks (5.9), and online library reference resources (5.6).

Campus Services on the Web

Data from the 2003 Campus Computing Survey also reveal continuing gains on various Web-based campus services. One major measure of progress is that the percentage of institutions reporting online course registration, online transcripts, and online course reserves has tripled since 1998.

Over half (53.3 percent) of the nation's colleges and universities can process credit card payments from their campus Web sites, up from two-fifths (40.5 percent) in 2002, 27.6 percent in 2001, and more than double the number from 2000 (18.6 percent). In contrast, just 5.1 percent of the campuses participating in the 1998 survey could process credit card transactions from their Web sites. More than two-thirds (70.9 percent) of the institutions participating in the 2002 survey report that their campus Web site offers online course registration, compared to just over half (55.4 percent) in 2001, 43.1 percent in 2000, and 20.9 percent in 1998.

While many in the campus community may feel good about the dramatic progress made since 1998, higher education's primary clientele—students ages 17 to 67—often look at many campus Web sites and portals and find them wanting. Depending on age and experience, for many students the reference point for "services on the Web" will be Amazon, Abercrombie, AFT (American Federation of Teachers), or even AARP (American Assoc. of Retired Persons—where membership eligibility begins at age 50!). These sites, and others (for example, online travel services, banks, credit card companies, and cell phone providers) offer increasingly customized Web-based services that have become the standard against which all others are measured. In this context, it is not surprising that the campus community is still roughly two years behind the consumer sector in many of its "services on the Web" offerings.

Indeed, other data from the 2003 survey support the notion of lagging services on the Web. This year's survey respondents rated the campus infrastructure for eCommerce and portal services as 12th and 13th on a 13-item list of technology metrics that include network and tele communications services, user support services, online instructional resources, network security, and IT training for students and faculty.

A Declining Priority of Instructional Integration?

As in the past years, survey respondents across all sectors of higher education continue to identify "assisting faculty integrate technology into instruction" as the single most important IT issue confronting their campuses "over the next two or three years." However, the numbers have dropped dramatically since 1998, falling by half across almost all sectors.

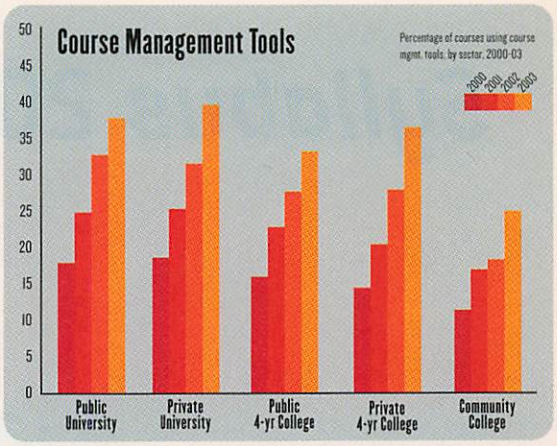
These declines reflect not so much a declining importance of instructional integration as the rising priority of other issues—IT financing, ERP upgrade/ replacement, and wireless—that now compete for the time and attention of the survey respondents, typically CIOs, and also compete for increasingly restricted institutional resources (people and money).

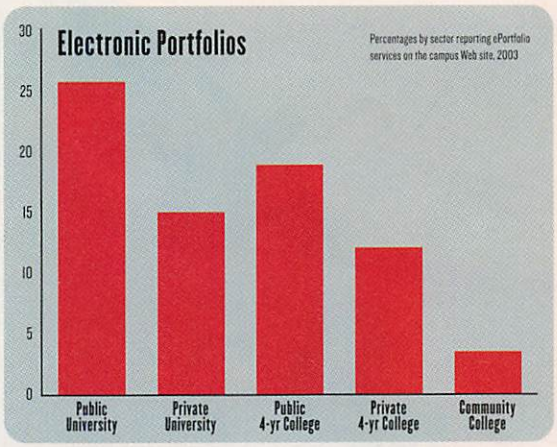
Course Management Systems and ePortfolios

Course Management Systems continue to play a increasingly significant role in instruction across all sectors. The 2003 survey data also indicate that a third (33.6 percent) of all college courses now use course management tools, up from 26.5 percent in 2002, 20.6 percent in 2001, and almost double the level in 2000 (14.7 percent). The survey data also reveal that over half (51.4 percent) of the survey respondents report that their institution has a strategic plan for deploying course management tools, compared to 47.5 percent in 2002. More than four-fifths (82.3 percent) of the participating institutions have already established a "single product" standard for course management software, up from roughly three-fourths (73.2 percent) in the 2001 survey and 57.8 percent in 2000.

The CMS data are interesting as they reflect the arrival of course management tools or learning management software as a core component of the institutional instructional infrastructure: Both the percentage of classes that use CMS resources and the number of institutions that have established a campus standard for a CMS product continue to rise.

As an extension of course management and assessment initiatives, Electronic Portfolios (ePortfolios) are also emerging as a important resource for students and for institutions. Fully an eighth (13.5 percent) of the institutions participating in the 2003 survey offer ePortfolio services on their campus Web sites. However, the aggregate data mask significant variations by sector as ePortfolio resources are available to students at a fourth (24.6 percent) of public research universities, but at less than 5 percent of community colleges.





Continuing Budget Cuts

Two-fifths (41.3 percent) of the institutions participating in the 2003 Campus Computing Survey report a decline in the academic computing budget at their campus for the current academic year, compared to a third (32.6 percent) in 2002, just under a fifth (18.0 percent) in 2001, and about one-eighth (11.4 percent) in the 2000 survey report. The budget challenges were most pronounced in public four-year colleges, where this year budget cuts affected well over three-fifths (62.9 percent) of institutions,

continued on page 38

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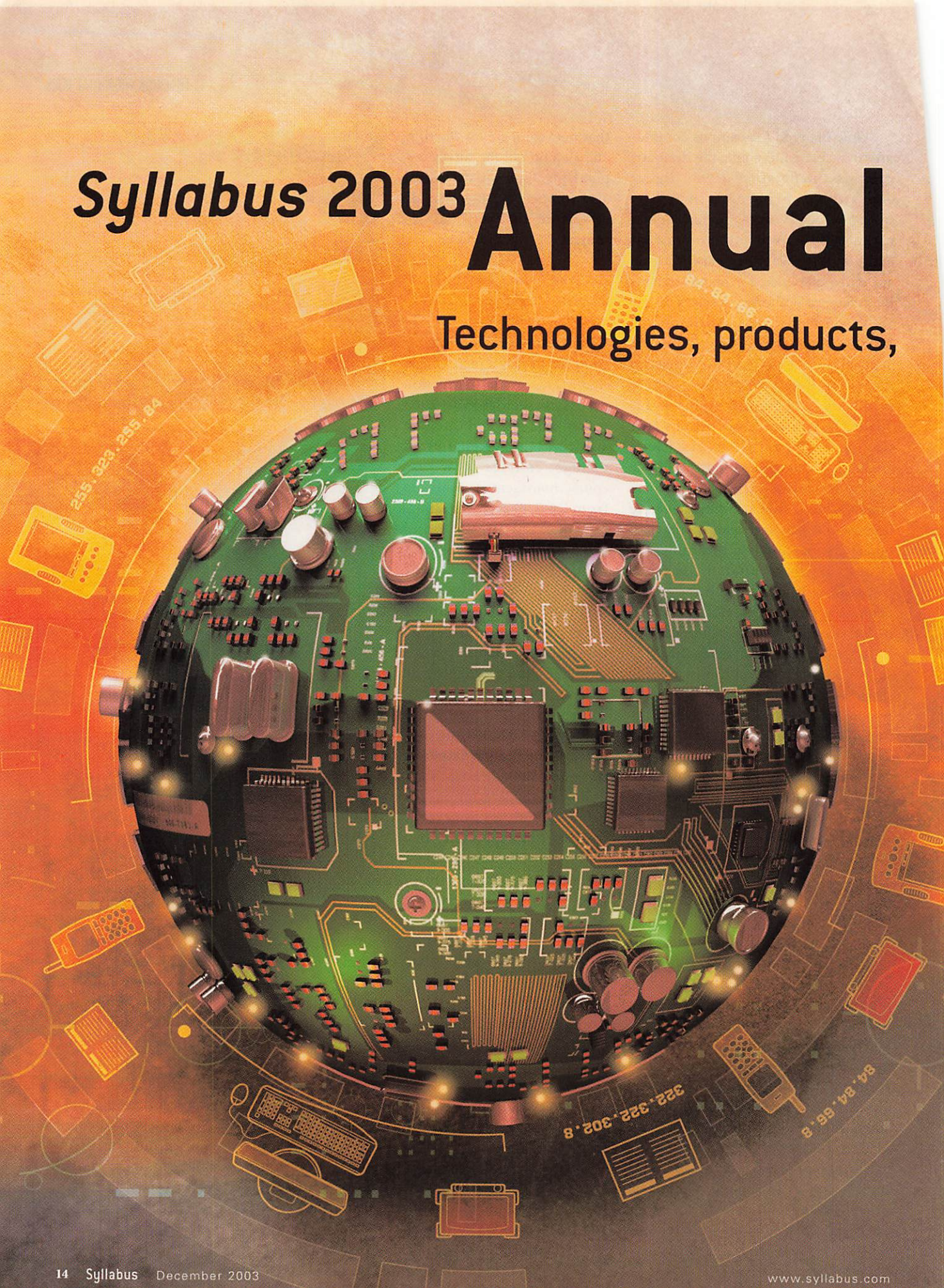
Technologies, products,



Buyer's Guide

and services for the campus

Networking and Telecommunications

Wired networks are established and in place for the most part, although companies like Yipes are working to close the gaps that remain. The word in networking now is wireless: moving beyond landlines to connect people and networks via radio frequencies, beams, and satellites.

Wireless Networking

Apple Airport Extreme

Airport extreme has two components: the Airport Extreme Card and the Base Station. With both of these components installed, AirPort Extreme, based on the 802.11g wireless standard, delivers data rates at 54Mbps, nearly five times faster than the 802.11b standard. The AirPort Extreme Base Station also features a compatibility mode as its default setting that supports all 802.11b-compliant products. In this case, the connection is at data rates up to 11Mbps. The AirPort Extreme Base Station can serve up to 50 Mac and Windows users simultaneously. The AirPort Extreme Base Station comes equipped with a built-in firewall to help prevent access to sensitive data on the computer and the ability to secure over the air transmissions with 128-bit WEP encryption. Bridging, allows one AirPort Extreme Base Station to connect to another AirPort Extreme Base Station, eliminates the need to run expensive cables to extend a network. Previously, all AirPort Base Stations required a physical connection to the Internet. With wireless bridging, two or more AirPort Extreme Base Stations can be connected wirelessly and effectively, increasing the range of a network. The Airport Extreme Base Station also comes with a USB port allowing users to connect to a USB printer and share it wirelessly.

Contact: ***Apple Computer****, Cupertino, CA; (408) 996-1010; www.apple.com.*

Colubris

Colubris Networks develops secure, wireless LAN solutions for enterprise networks. Their turn-key solution includes a firewall, router, and other functionality needed to completely implement a wireless network. Colubris products are designed to integrate seamlessly into an enterprise security framework and leverage investments in existing network infrastructure. Colubris's robust, VPN-caliber security mechanisms eliminate the need for external devices to ensure wireless security. Enterprise management features make the wireless LAN completely manageable from within existing operations framework. Colubris interoperates with existing software and systems to deliver a cost-effective solution and leverage existing investments. Two of Colubris's products are in use at higher education institutions throughout North America. The CN1050 provides secure Wi-Fi service to authenticated users. It uses encryption technology to protect data from eavesdroppers. The CN3000 provides user authentication, but does not encrypt data traffic. It provides a service that is very similar to a public hotspot, such as an Internet café.

Contact: ***Colubris****, Waltham, MA; (781) 684-0001; www.colubris.com.*

fSONA

fSONA Communications was founded in 1997 to deliver simple wireless solutions for carrier, service provide, and enterprise networks around the world. The SONAbeam series of free space optical (FSO) networking products use an unlicensed, wireless technology operating at speeds up to 2.5Gbps and distances up to 5km (3 miles). SONAbeam avoids the cost of digging to lay fiber and licensing for radio frequencies. SONAbeam is operational in 24 countries around the globe and was named Product of the Year by *Network Magazine.*

Contact: ***fSONA****, Richmond, British Columbia, Canada; (877) Go-FSONA; www.fsona.com.*

RoamAbout Wireless LAN Access Platform

RoamAbout R2, from Enterasys Networks, is a customizable and expandable enterprise-class, indoor and outdoor wireless platform. The RoamAbout R2 is designed to provide institutions with advanced networking features, an

Illustrated by Ryan Etter

upgradeable architecture, advanced security features such as Wi-Fi Protected Access (WPA) and 802.1X support, and support for multiple standards-based 802.11 radio technologies. These features create a smooth technology migration, eliminating the need to upgrade an entire infrastructure or discard previously purchased PC radio cards. It also supports Enterasys' User Personalized Networking, a unique policy-based system that enables resource allocation based on individual users and their roles, to provide additional security, bandwidth management, and access control. The RoamAbout PC card uses radio frequencies instead of a LAN connection, seamlessly switching access points as the user moves about the network. Enterasys's higher education customers include Oberlin College, Sinclair Community College, and Tulane University.

Contact: ***Enterasys Networks,*** *Andover, MA; (978) 684-1000; www.enterasys.com.*

Spectrum24

Symbol's local area networking, Spectrum24, is a wireless classroom solution that relies on handheld devices. The goal is to overcome insufficient or inconvenient data drops, provide students with ready access to technology tools, and simplify technology use for teachers. Administrators, teachers, and security personnel have instant access to student records. Symbol uses bar code laser scanning to facilitate the creation of a completely mobile and interactive classroom.

Contact: ***Symbol Technologies,*** *Holtsville, NY; (631) 738-5451; www.symbol.com.*

Wired Networking

Yipes Communications IP Over Fiber Networking

Yipes Communications uses the Ethernet and IP networking to link businesses and campuses to the Internet via high-speed optical fiber. Yipes sells bandwidth on demand. Users pay as they go only for what they use. Yipes connects directly to the end users, covering the "last mile" that carriers typically do not cover. Because Yipes operates via Ethernet, no translating hardware and software, and thus no hardware purchases are required between its Gigabit routers and the customer. With Yipes' managed optical IP networks, customers can scale their bandwidth use up or down in 1MB increments up to one gigabyte, with three hour's notice. Yipes products feature unique IP over fiber networking. Yipes MAN (Metro Area) provides LAN-to-LAN connectivity to increase local area network connection speeds on demand. Yipes also offers Yipes WEB, a collection of managed hosting options, network design, and implementation services.

Contact: ***Yipes Communications,*** *San Francisco, CA; (977) 740-6600; www.yipes.com.*

PC MACLAN

Campuses that need to network PCs and Macs together may want to turn to PC MACLAN, a connectivity solution that allows institutions to make the most of both platforms. With PC MACLAN, network users can utilize all existing AppleShare resources; create a seamless, Peer-to-Peer network of Windows PCs and Macs over a LAN, WAN, the Internet or remote dial-up; transfer files between PCs and Macs over IP or over AppleTalk; share printers by printing directly from a PC to AppleTalk or PostScript printers attached to the Mac network, or printing from a Mac to PostScript or to non-PostScript printers attached to a PC; and use a PCs as AppleShare (Mac) File Servers. PC MACLAN version 9.0 now supports files over 2GB in size and longer file names, offers expanded printer support, provides full support for OS X 10.2, supports network drives.

Contact: ***Miramar Systems,*** *Santa Barbara, CA; (805) 966-2432; www.miramar.com.*

Finding Wi-Fi

So you've decided to go wireless. Your thoughts are full of visions of conducting your business from cafes, airports, and train stations. But how do you know you'll be able to connect once you get there? One way is to boot up your laptop and search for a signal. Or you could get the Kensington Wi-Fi finder, a little device that tells you, with the touch of a button, whether your location is a hotspot or not. Three lights indicate the strength of the available signal. The little Wi-Fi finder, which fits into a pocket, detects 802.11b, and most 802.11b/g signals from up to 200 feet away and filters out other wireless signals, including cordless phones, microwave ovens, and Bluetooth networks. The Kensington product is the only such device on the market. It retails for under $30.

Contact: ***Kensington,*** *San Mateo, CA; (650) 572-2700; www.kensington.com.*

Telecommunications

Wave Three

Wave Three Software uses the Session Initiation Protocol—communication software with a real-time IP-based communication solution optimized for use by researchers, medical practitioners, and higher education professionals. Wave Three provides users with exceptionally high quality collaboration tools that combine voice, video and data applications in one suite. The SessionT product provides users unmatched flexibility supporting Voice over IP, Video over IP, application sharing, and media sharing in a single application. Moreover, Session is a SIP-based network solution is cross platform compatible and can run over standard desktop or laptop computers, using Windows 2000/XP or Mac OS X.

Contact: ***Wave Three,*** *San Diego, CA; (858) 404-5500; www.wave3software.com.*

Multimedia, Video, and Web Development Tools

Interactive media products have become more robust and full-featured. Where we use to purchase separate products for video, animation, graphic design, collaboration, storage, and presentation, we can now find one or two solutions that take us from the germ of an idea to a disseminated work in much less time. We publish directly to the Web in a seamless digital process. We've surveyed some of the top tools for content development and multimedia presentation.

Web Development Tools

Adobe Creative Suite

The Adobe Creative Suite is a complete design solution that offers the tools creative professionals need to create and publish content for print and the Web faster, more easily, and more affordably than ever. It combines the full, newest versions of Adobe's leading-edge creative applications—Adobe Photoshop CS with Adobe ImageReady CS, Adobe Illustrator CS, Adobe InDesign CS, Adobe GoLive CS, and Adobe Acrobat 6.0 Professional—with the innovative, new Version Cue file version manager. It also supports a full Adobe Portable Document Format (PDF) workflow and offers a robust collection of educational resources, a single installer, and expanded support options.

Contact: ***Adobe Systems****, San Jose, CA; (800) 833-6687; www.adobe.com.*

Eveo Publisher 3.0

Eveo, known for both its applications and services, is now offering an integrated suite of four applications—creation, asset management, deployment, and reporting. With a drag-and-drop interface and user-friendly toolbox for creating rich media and Web video presentations on the fly, Eveo Publisher 3.0 is designed to be simple to use, providing an intuitive media management system to upload, categorize, and manage assets; workflow and review functions to let users manage their brand and marketing assets centrally; and remote access for group collaboration. Once a rich media page is created, the user can view it and activate it with a mouse click either as a stand-alone Web page or an embedded e-mail. Tracking utilities can track streaming activity, user events, popularity, and other feedback. Publisher 3.0 is available as a hosted application or through enterprise licensing.

Contact: ***Eveo****, San Francisco, CA; (415) 749-6777; www.eveo.com.*

Flash MX

Flash is a professional Web development tool—a full-featured product with an omnipresent counterpart on the client side: the Flash player, which is installed on millions of personal computers and used by over 400 million Internet users. Flash files incorporate rich media in a small file size. Flash MX features video, multimedia, and application development components for creating rich Web experiences. Users can import any standard video file supported by QuickTime or Windows Media Player, including MPEG, DV (Digital Video), MOV (QuickTime), and AVI. Flash MX can manipulate, scale, rotate, skew, mask, and animate video objects. It can also make objects interactive with the help of scripting. The panel layout, accelerator keys, and publish settings are all customizable. A new intuitive user interface is available in this version. Included are prepackaged templates and learning interactions that provide users with ready-to-go shells for dynamic Flash presentations, slide shows, menus, and quizzes. Users who have two versions can work with the same document.

Contact: ***Macromedia,*** *San Francisco, CA; (800) 833-6687; www.macromedia.com.*

IBM WebSphere Studio

IBM WebSphere Studio, available in both Application Developer and Enterprise configurations, integrates various Web application development roles and software languages into one environment. By creating a single development environment, WebSphere Studio allows users to create Web services from both new and existing software across multiple platforms, languages, applications, and vendors.

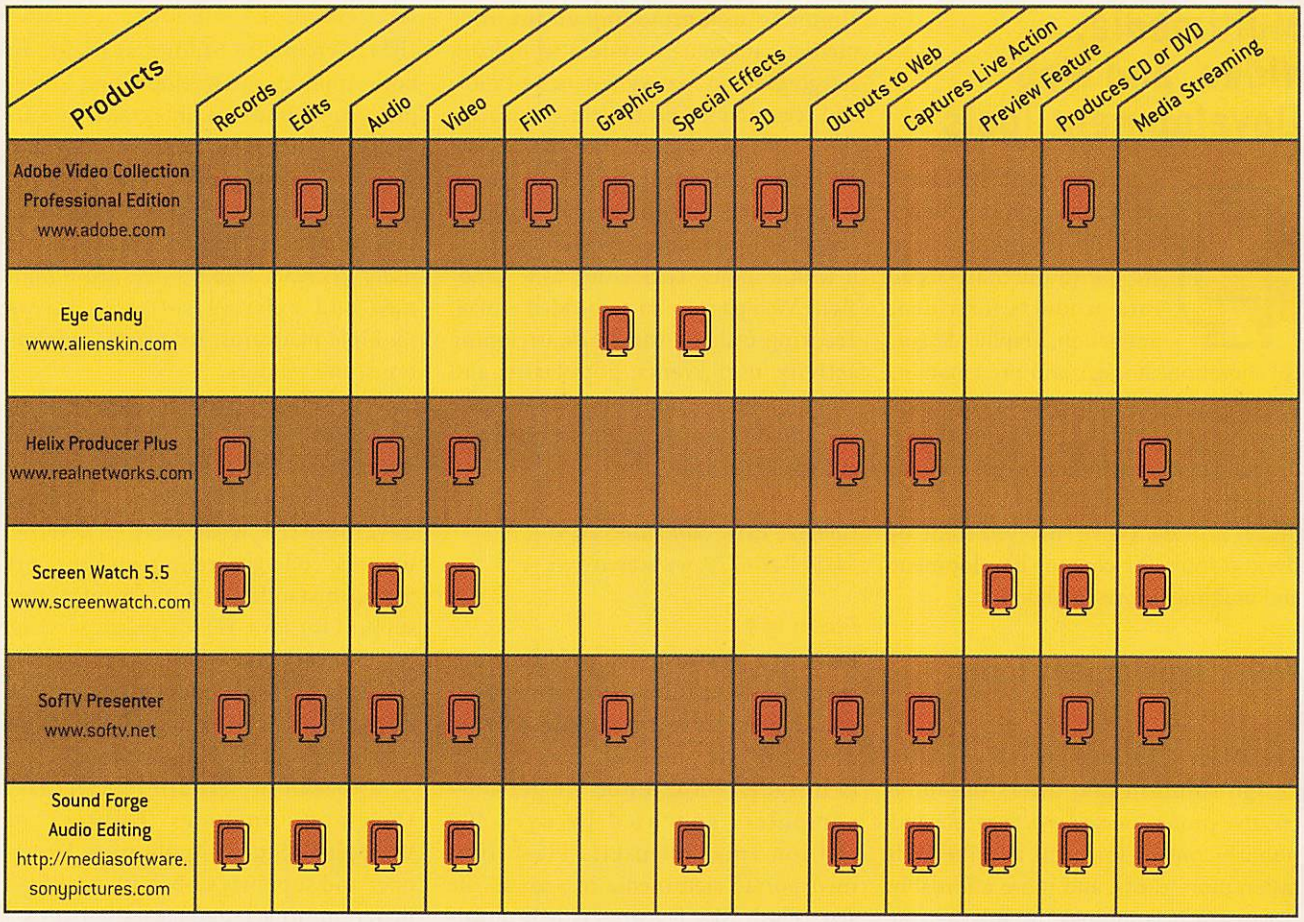
WebSphere Studio Application Developer helps to optimize and simplify J2EE (Java 2 Enterprise Edition) and Web services application development with best practices, wizards, code generation, and support for open standards. It offers integrated support for Java, HTML pages, servlets, JavaServer Pages (JSP), Enterprise JavaBean (EJB) components, and XML documents. It also facilitates group collaboration and remote testing.

WebSphere Studio Enterprise Developer includes features of WebSphere Studio Application Developer and supports Cobol, PL, and EGL programming languages all within a single environment. This brings the advantages of J2EE, rapid application development, and team support to diverse development organizations, enabling them to modernize, re-use, and integrate existing assets written in older languages. Both the Application Developer and Enterprise Developer configurations of WebSphere Studio include support for J2EE, Linux, and emerging Web services standards.

Contact: ***IBM Corp.****, White Plains, NY; (888) 746-7426; www.ibm.com.*

XMetaL 4

Featuring tight integration with content management systems, Corel's XMetaL 4 consists of four tools designed to simplify development, deployment, and implementation of custom XML applications. XMetaL for ActiveX enables XML authoring in a browser or any Windows-based application. XMetaL Developer provides an IDE (document



Products	Records	Edits	Audio	Video	Film	Graphics	Special Effects	3D	Outputs to Web	Captures Live Action	Preview Feature	Produces CD or DVD	Media Streaming
Adobe Video Collection Professional Edition www.adobe.com	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	
Eye Candy www.alienskin.com						✓	✓						
Helix Producer Plus www.realnetworks.com	✓		✓	✓					✓	✓			✓
Screen Watch 5.5 www.screenwatch.com	✓		✓	✓							✓	✓	✓
SofTV Presenter www.softv.net	✓	✓	✓	✓		✓		✓	✓	✓		✓	✓
Sound Forge Audio Editing http://mediasoftware.sonypictures.com	✓	✓	✓	✓			✓		✓	✓	✓	✓	✓

Table 1: Mulitmedia and Video Tools

editing interface) for XML authoring customization and integration. XMetaL Author features Corel's spell check and thesaurus tools. XMetaL Central is a server-based environment manager that simplifies the deployment and maintenance of customized XML applications. Version 4 of XMetaL has an improved find and replace dialog box, enhanced support for W3C Schema, and improved WebDAV support.

Contact: ***Corel Corp.****, Ottawa, Ontario, Canada; (613) 728-8200; www.corel.com.*

Freeway Pro 3.5 and Freeway Express 3.5 (OS X and OS9)

Freeway Pro is an HTML generator that helps users build great Web content with professional layout, graphics and typography features—all without coding. Extensive drag-and-drop capability lets users add content from just about any source (Web pages in browsers, iPhoto, iTunes, MS Word, or the desktop) straight into a Freeway document.

Freeway Pro includes support for native Illustrator 10, Photoshop 7, TIFF, PICT, GIF, JPEG, Quicktime, MPEG, and SWF file formats, as well as the ability to manipulate compressed Flash files (change backgrounds and URLs). Within Freeway, users have access to all of Macintosh's fonts with full typographic control for creating GIF text. Freeway also scales image files and converts them to JPEGs, GIFs, or PING files, sparing the user the need for an external graphics editor.

Also from SoftPress, is Freeway Express 3.5 (OS X and OS9), created to offer home, school, and small business users an easy-to-use, accessible, and powerful tool to design and build great Web sites without having to worry about writing code. The "What You See Is What You Get!" approach to Web design means users can start building a site with an idea, not a list of restrictions, and see results immediately. Users draw—or simply drag-and-drop—pictures, text, graphic headlines, and rich media right onto the page. Scale, rotate, distort, and overlap these graphic elements, and combine them with HTML text for total design freedom.

Both versions work with FAST packs, which let users extend Web sites in new and exciting ways. With FAST packs users can build complex menu schemes, create, and modify graphics, or build millions of buttons—all without switching to another application. One FAST pack comes free with purchase of Freeway Pro.

Contact: ***Softpress****, Sausalito, CA; (415) 331- 4820; www.softpress.com.*

NetObjects Fusion 7.5

Designed to accommodate the needs of the basic home Web page builder as well as an experienced Web developer,

NetObjects Fusion 7.5 is replete with features that make it accessible. Beginning with its QuickStart building tips and tools, NetObjects Fusion 7.5 provides support for all proficiency levels. Novice users can build a Web site in three quick steps: choose a template, choose a style, and then add the content. They can connect pages through an easy-to-use, drag-and-drop layout manager that automatically adds navigation to link pages. Users can import content from other HTML sources or from other Web sites; the product also gives users the ability to import Word documents without loss of formatting. Fusion 7.5 includes built-in eCommerce solutions for launching an online catalog and shopping cart, enhanced Photo Gallery options for importing and displaying digital images, and integrated Web services for effectively managing and promoting Web sites. Other time saving tools include global asset management, cascading style sheets, and a library of styles to choose from.

Contact: ***Website Pros****, Jacksonville, FL; (877) 650-8171; www.netobjects.com.*

Sonic Foundry MediaSite Live

Mediasite Live is a rich media Web communication system that provides all the hardware and software needed to create and deliver instructor-led distance education over the Web. Mediasite Live automatically captures, synchronizes, streams, and archives online multimedia presentations in real time, thereby eliminating the need for any special preparation, costly production or complex authoring. For the professors, Mediasite Live is completely transparent to what they do. No more having to pre-record classes. No restrictions to the materials they can use. Just show up and teach as usual.

The highly versatile Mediasite Live captures in real time any kind of data output (PowerPoint, Excel, live Web pages, DVD, complex imagery, etc.) from any presentation device (laptops, projectors, document cameras, graphics tablets, smart boards, even traditional chalk boards). The content is instantly synchronized with the audio and video of the instructor, and streamed live to the Web. The captured presentation is immediately archived for convenient on-demand viewing. The product's unique dual channel real-time processing enables it to handle even the most complex engineering diagrams, detailed medical imagery, intricate drawings that require visual clarity.

Contact: ***Sonic Foundry****, Madison, WI; (877) 783-7987; www.sonicfoundry.com.*

Electronic Publishing

Perhaps no traditional industry has been revolutionized by technology as much as publishing. With the help of tools like the ones listed below, anyone can build or find appropriate content, produce it, and publish it in print or online. New tools help authors collaborate with each other. Features that once were the domain of technical professionals are now accessible to the average user. Easy-to-use, drag-and-drop features have simplified the process of presenting dynamic content generated in or collected from various media sources.

Arbortext 5

Arbortext produces XML-based software for publishing to a variety of media from a single content source. Arbortext's software suite is designed to streamline the process of creating and publishing complex documents. Arbortext 5, available in March 2004, will include seven components: Enterprise Editor, the authoring tool, content creation. It allows content to be stored in content management repositories and assembled on demand. Enterprise Editor builds content for publishing in a variety of media, including Web, CD-ROM, print, and wireless. The Enterprise E-Content Engine (E3) converts content from Microsoft Word, Adobe FrameMaker, and Interleaf documents to XML, and publishes that content to print, PDF, Web, and wireless. Contributor, the browser-based XML editor, helps contributing authors and subject matter experts create XML content. Companion, Arbortext's new add-in for Microsoft Word 2003, will provide several key features to XML applications in Word, including automatic styling of tags and access to E3 for publishing. In addition, Arbortext 5 includes Architect, a rapid prototyping tool, and a Dynamic Content Assembly Manager tool to help streamline.

Contact: ***Arbortext****, Ann Arbor, MI; (734) 997-0200; www.arbortext.com.*

Adobe Framemaker 7.0

FrameMaker 7.0 features new XML capabilities that allow users to create, edit, import, and publish content in many formats, including print, PDF, HTML, SGML, and XML. Version 7.0 essentially blends the WYSIWYG features of FrameMaker with the publishing options of FrameMaker+ SGML. Users will find comfort in the WYSIWYG layout and the continuous validation feature. The software offers a choice of two authoring modes: the familiar word processing, style-tagging mode, or a fully structured authoring environment optimized to produce valid XML and SGML files. FrameMaker 7.0 offers enhanced book authoring and layout features, the ability to process thousands of pages of content, and built-in features that automate and simplify mundane document preparation tasks. FrameMaker outputs to tagged Adobe PDF files, which are accessible to users with visual disabilities who read with the aid of a screen reader. FrameMaker offers long document support that includes book management features,

sophisticated templates, and rich formatting options.

Contact: ***Adobe Systems****, San Jose, CA; (408) 536-6000; www.adobe.com.*

Morphon XML Editor 3

Now free to anyone who wishes to download it, the Morphon XML Editor lets users create and modify XML documents. Morphon also provides a Cascading Style Sheet (CSS) editor. Because it is written in Java, the XML Editor runs on any platform. Morphon's XML Editor features WYSIWYG editing, a validation engine, and hierarchical views. Views are extensible through a plug in API with DOM3 support. New to the latest version are a spell check, print previews feature, folding options, support for tables, support for Mac OS menu bar, automatic save feature, and many more enhancements. Users can view the edit in three modes: no tags, boxed tags, and inline tags. Users can also work remotely via HTTP or FTP.

Contact: ***Morphor Technologies****, Rotterdam, The Netherlands; +31 (0)10 750 2600; www.morphon.com.*

Design Science's MathML Tools

Design Science offers a range of tools for working with MathML. First is MathType, the professional version of the Equation Editor in Microsoft Office, which enables the user to easily create equations by pointing and clicking, and can convert those equations into MathML, in either 1.0 or 2.0 versions. Users can apply this capability in several ways. For instance, from within the MathType editing window, one can capture all or part of an equation written in MathML and place it into an open HTML or XML editing window. From within a Microsoft Word document, using MathType's MathPage technology, users can save the document as a Web page with all of the symbols and equations represented as MathML within the HTML page. Web pages produced this way can be displayed in Microsoft Internet Explorer for

Libraries	Holdings	URL
ATLA	Large collection of theological images.	www.atla.com/digitalresources/
Bartleby.com	Free access to general literature, reference, and verse.	www.bartleby.com
California Digital Library	Scholarly material, images, eBooks, Web sites, and statistics, etc.	www.californiadigitallibrary.org/
Cuneiform Digital Library Initiative	Digital repository of images, transliterations, and glossaries.	www.early-cuneiform.humnet.ucla.edu/
Early English Books Online	Over 100,000 works produced in English, including 500,000 pages of content added in late 2003.	www.lib.umi.com/eebo
Electronic Text Center at the University of Virginia	70,000 online and offline texts in 13 languages.	www.etext.lib.virginia.edu/
Everglades Digital Library	Science, natural history, photos, educational and interpretive materials, datasets, and maps.	www.everglades.fiu.edu/library/
Highwire	618,000 free articles from 344 science journals.	www.highwire.stanford.edu/
Humanities Text Initiative	Diverse collection of religious and secular texts, Lincoln's speeches, and medieval poetry.	www.hti.umich.edu/
Internet Classics Library	Over 400 works by more than 50 classic authors on this site sponsored by MIT.	www.classics.mit.edu/index.html
Internet Public Library	Collections in most academic areas, reference works, reading room, and special sections for kids and teens.	www.ipl.org/
JSTOR	Preeminent source for archived scholarly journal articles.	www.jstor.org/
NASA Astrophysics Data System	NASA-funded project maintaining four bibliographic databases with more than 3.5 million records.	www.adswww.harvard.edu/
National Academy Press	More than 2500 titles from National Academy Press and Joseph Henry Press—a free read online.	www.books.nap.edu/index.html
New York Public Library Digital Library Program	"The accumulated wisdom of the world" in free, electronic format.	www.digital.nypl.org/
Online Book Page	Links to thousands of online books, wherever they may be housed.	www.onlinebooks.library.upenn.edu/
Perseus Project	Humanities texts from the ancient and modern world.	www.perseus.tufts.edu/
Project Gutenberg	10,000 public domain "light" and "heavy" literature and works of reference, available in ASCII files.	www.gutenberg.net
Virtual Library	Collection of materials on a wide range of subject areas.	www.vlib.org/
Virtual Reference Desk	Digital reference "Aska" services, primarily for K-12 students.	www.vrd.org/
Visible Human Project	Complete, anatomically detailed, 3D representations of the human body, both male and female.	www.nlm.nih.gov/research/visible/visible_human.html

Table 2: Digital Libraries – A sampler

Windows enhanced by Design Science's free MathPlayer MathML display software, Netscape 7.0, or Mozilla. Another Design Science tool, WebEQ Developers Suite, is a comprehensive toolkit for building Web pages that include interactive math. eLearning companies, content developers, and education portals are using WebEQ to create Web-based learning environments that help educators engage students in math and science on the Web. Because WebEQ is based on Java and MathML technology, developed solutions will be platform- and browser-independent. MathFlow is a suite of production tools for STM publishers (science/technical/medical) working with MathML in XML workflow. MathFlow consists of three separate tools, one for each phase of the production process: MathFlow Exchange, which converts equations in Microsoft Word documents (both Equation Editor and MathType equations) into XML+MathML documents; MathFlow Editor, a WYSIWYG, native MathML editor that can be used to author and edit MathML in conjunction with various XML editors, similar in feel to using MathType with Microsoft Word; and MathFlow Composer, which outputs XML pages with MathML into HTML, XTHML, and PDF formats.

Contact: ***Design Science****, Long Beach, CA; (562)433-0685; www.dessci.com.*

Macromedia eLearning Suite

The integrated set of eLearning tools from Macromedia includes Authorware 7, Dreamweaver MX, and Flash MX. LMS knowledge objects simplify the task of complying with learning management system standards. Authorware lets users import PowerPoint files and add to them, building rich, interactive learning experience. Intuitive tools such as drag-and-drop outlining and menu-based content creation designed to make authoring easy. Flash MX software helps users integrate video, text, audio, and graphics, create animation, add interactivity, and incorporate rich-media assets into a presentation or publication. The Web site and application building tool Dreamweaver MX facilitates the development of Web-based content.

Contact: ***Macromedia****, San Francisco, CA; (415) 252-2000; www.macromedia.com.*

Click2Learn Toolbook Instructor

ToolBook Instructor, an interactive content development tool from Click2learn, includes hundreds of preprogrammed catalog objects in a robust, object-oriented development environment that support visual programming and scripting to create interactive behaviors for custom or adapted content. Content produced with ToolBook is interoperable with learning management systems through SCORM and AICC standards. ToolBook Instructor content can be launched, bookmarked, and tracked using SCORM or AICC. ToolBook Instructor supports a wide variety of media files, including sound, animation, digital video, streaming media, and still images. It supports Flash animation files, RealPlayer, Windows Media Player formats, GIF, and JPEG files. Toolbook provides assessment capabilities through a number of assessment types: true/false, multiple choice, drag-and-drop, and others. Content developed in ToolBook can be deployed on the Internet, an intranet, a local area network (LAN), or CD-ROM. Users can integrate ToolBook Instructor content with the Click2Learn's Aspen Learning Management System or any other standards-based learning management system for a complete solution.

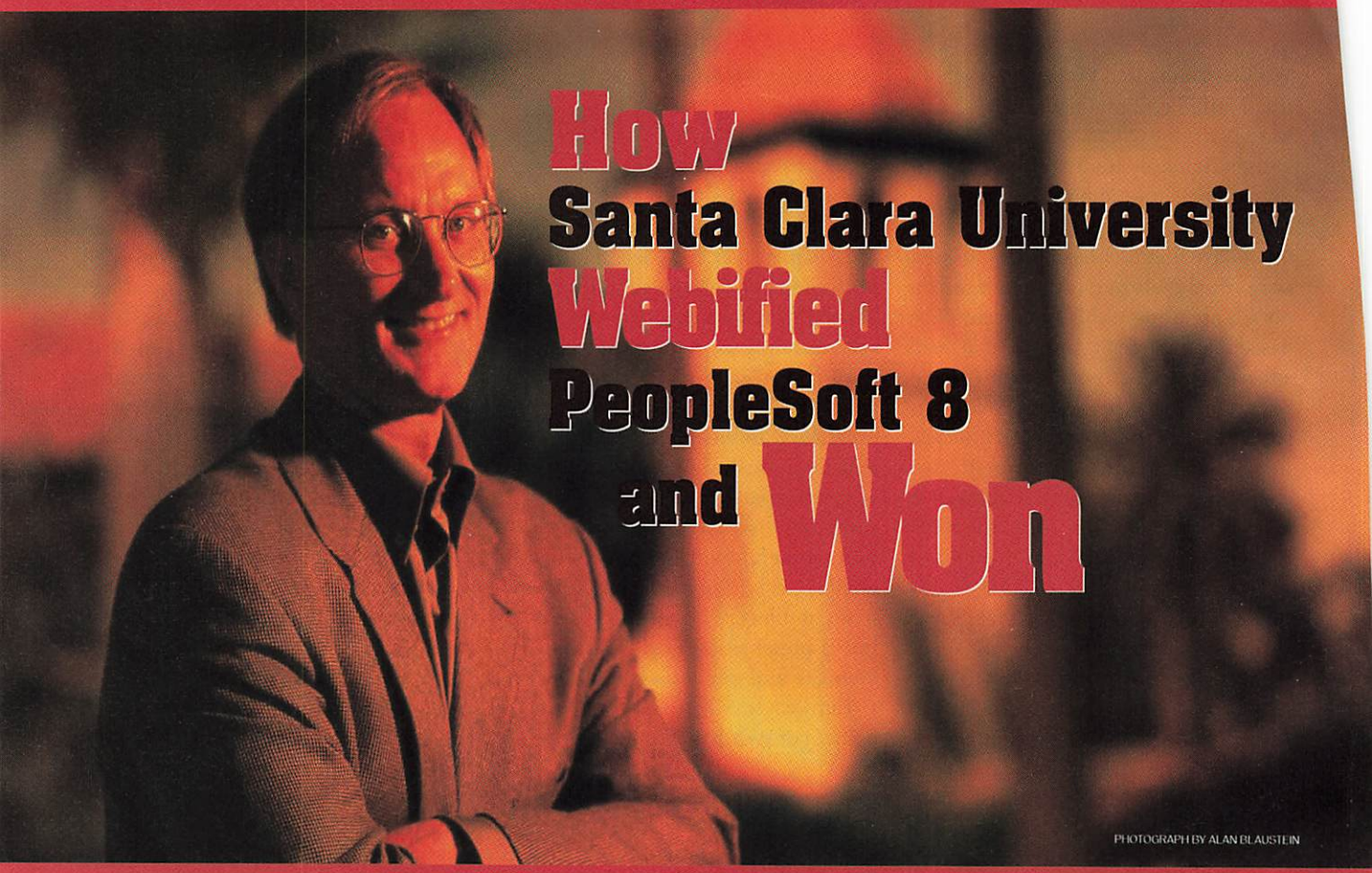
Contact: ***Click2learn****, Bellevue, WA; (425) 462-0501; www.click2learn.com.*

Curriculum Software

Publishers and professors have been cautiously moving content from the printed book to the screen. Simulations and virtual experiences are now available for many academic courses. We see this particularly in the sciences, where the ability to experience, fairly realistically, the microscopic, the dynamic, and the theoretical has changed the way students approach learning. The humanities have discovered the value of being able to organize ideas and gather information more creatively. In foreign language learning, media always had a valuable role to play. This is an area where technology is readily accepted and new approaches to teaching are welcome.

Biology Labs Online

Biology Labs Online consists of 12 inquiry-based interactive labs covering standard laboratory topics in introductory biology. The simulations serve a number of purposes, from complementing existing "wet" labs to augmenting hands-on labs as tools for further study. Some labs offer content typically not covered in lab courses because of time, safety, or financial constraints. Each lab features an introduction, list of objectives, bibliography of prerequisite reading, glossary, and the lab assignment itself. Among the experimental topics are evolution, photosynthesis, cellular respiration, population ecology, and genetics. As in a hands-on lab, students control and adjust variables, run tests, and draw conclusions. Students can design their own experiments, some of which are uniquely available in a simulation format: for instance, in the evolution lab, students can observe changes over hundreds of years. The applets rely on smart objects that perform much like their real-life equivalents or at least simulate their actions. Because biology is taught at several levels, the publisher offers both nonmajors and majors-level lab assignments. The labs are also suitable for AP Biology



How Santa Clara University Webified PeopleSoft 8 and Won

PHOTOGRAPH BY ALAN BLAUSTEIN

CIO Ron Danielson's Triple Play of Bandwidth Savings, Increased Server Capacity and Extended Life Cycle.

THE IDEA was to provide more widespread access to business-critical enterprise applications without increasing the administrative burden on the IT department. Before that goal would be realized, however, Santa Clara University (SCU) got a lesson in what can go wrong with Web-based applications and, more importantly, how to remedy the problems.

In July of 2002, SCU made the move to PeopleSoft 8, the Web-enabled version of the popular application suite. The school uses PeopleSoft to support human resources, financial and student administration applications, including admissions, financial aid and course registration programs, says Ron Danielson, chief information officer for SCU, an 8,000-student university in Santa Clara, Calif.

"As much as we possibly can, it's our intention to push access to administrative information out to students, faculty and staff," Danielson says. With the previous version of PeopleSoft, that was a challenge because it required client software on each user's desktop. "With the Web front end, anybody with a browser can come in and get access."

Access they did, so much so that the university's application servers were overloaded and performance was much slower than with the previous version. "We were one of the first half-dozen universities in the country to upgrade to PeopleSoft's new Web-based product, and we thought we'd spec'd out our network and equipment adequately to meet our performance needs," he says. "But we weren't even close."

SCU'S REDLINE BENEFITS AT A GLANCE:

- **Bandwidth reduction: E|X 3250 reduces bandwidth requirements by up to 10M bit/sec, saving SCU at least $48,000 per year.**
- **Increases server capacity: Offloads connection management, I/O and SSL processing, essentially cutting server loads in half.**
- **Reduces number of network components: Reduces the amount of data traffic, enabling network components such as firewalls to handle more load.**

IN SEARCH OF A FIX

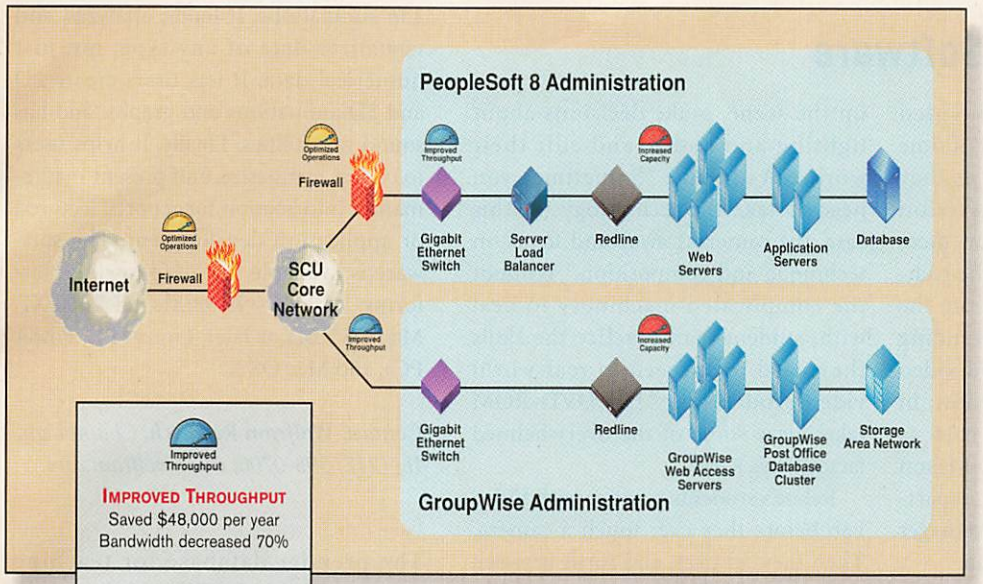
Initially, Danielson and his staff tried throwing more hardware and software at the problem. To an initial configuration of one Web server and one application server, they added three more Web servers and one new application server. They also brought in performance management and software tuning tools, and changed some PeopleSoft parameters related to processing input from users.

"This brought performance to an 'acceptable' level," Danielson says. "But now we had six servers instead of two, and we were still spending a lot more time on the problem than we would have liked."

In the fall of 2002, the university learned about Redline Networks of Campbell, Calif. Redline makes a family of appliances designed to improve Web-based application performance by offloading from the server I/O processing and connection management chores, while compressing content to conserve bandwidth. The appliances also handle Secure Sockets Layer (SSL) processing, thus serving to improve security.

LESS BANDWIDTH, MORE PERFORMANCE

In November, SCU installed one of Redline's E|X 3250 appliances and saw an immediate,



dramatic improvement. Bandwidth usage associated with the PeopleSoft applications plummeted by 70%, thanks to the compression features inherent in the E|X 3250. At the same time, because the E|X 3250 handled connection management chores and I/O processing, server capacity effectively doubled.

The magnitude of server capacity and performance improvements hit home when one of the university's servers went down for more than a week. "We didn't even notice a change in performance," Danielson says. "That tells us how much headroom the Redline box has given us with our PeopleSoft applications."

Like the rest of Redline's enterprise application processors, the E|X 3250 sits in front of servers and receives requests from hundreds or thousands of client browsers. It processes the thousands of relatively slow requests as they come in from users and shuttles them to the appropriate servers at high speed over just a few dozen persistent TCP connections.

"As far as the Web servers are concerned, they have a single connection, which is to the Redline box," Danielson says. The servers no longer have to perform complex scheduling of requests arriving randomly over a large number of connections. Instead, they service each response as it arrives and send information back to the enterprise application processor, which delivers pages to the client browser at whatever speed the browser can efficiently handle.

The E|X 3250 worked so well for SCU's PeopleSoft implementation that the university soon installed an additional unit to improve the performance of Novell GroupWise servers that provide Web-based e-mail access. Here the E|X 3250 sits in front of four servers, performing load balancing, connection management and compression. For its GroupWise application, the university also takes advantage of the E|X 3250's SSL offload capability, which obviates the need for the servers to maintain large amounts of user data, including client certificate information. It also ensures that end users have no direct access to the application servers and the often-sensitive information they contain.

Results from the GroupWise implementation have been similar to those for PeopleSoft: bandwidth consumption on the university's WAN links has been cut in half and response time has improved.

SAVINGS, SAVINGS, SAVINGS

The bottom line, Danielson says, is that the Redline appliances enable SCU to realize savings in three areas: bandwidth reduction, increased server capacity and extended life cycle of other network components.

Bandwidth savings come from the compression features of the appliance, which are browser-aware to adaptively compress content for each requesting user and never require specialized client software. The features save 6M to 10M bit/sec of bandwidth, which Danielson says would cost the university an additional $4,000 to $5,000 per month.

In terms of server capacity, Danielson figures he could remove two of the four servers supporting his PeopleSoft implementation without suffering a performance hit, although he has opted to leave the installation as-is to allow for anticipated growth in the number of applications and users. Similarly, on the e-mail side, "We probably won't have to grow that server farm dramatically to handle additional load," he says.

Just as the Redline appliances enable him to get more life out of his servers, they do the same for network components such as firewalls. "With the Redline box reducing bandwidth usage, there's less for the firewalls to examine," so a single firewall can effectively handle more load.

In coming months, SCU will be adding to its Redline implementation another server group that supports university financial applications.

To sum up, Danielson says, "This box delivers on all its claims."

LEARN MORE ABOUT REDLINE NETWORKS ONLINE:

Hear Ron Danielson tell his story in an on-demand webcast.
Visit: http://www.itworld.com/redline

Download the white paper,
"The New Data Center: Toward a Consolidated Platform."
Visit: http://www.redlinenetworks.com/p/whitepaperrequest

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Lights, Camera, Software

Students in Susan Kehoe's video production courses spend a lot of time learning to operate cameras as they prepare for careers in television production. According to Kehoe, there are really two facets to using the technology: knowing how to operate the equipment itself and understanding the nuances of technique and video composition. Kehoe should know; in addition to her teaching role as adjunct professor in George Mason University's Communications department, she serves as General Manager for the campus television station.

Because the process of learning video production is so critical and complicated, Kehoe overlaps hands-on camera experience with time spent using VideoLab, a DVD-ROM developed by Herb Zettl and published by Wadsworth/Thomson. VideoLab simulates real experience: students set up the scene, make decisions about lighting and audio, and edit their work. Says Kehoe, "Sometimes you need to take the technology (in this case, the cameras) away and focus on technique and composition." Without the complicated machinery to deal with, students can practice the skills they need to succeed in real-world video production. "The DVD-ROM takes away some of the overwhelmed factor," says Kehoe.

Kehoe's students practice with Video Lab before they ever touch a camera. Then they go back and forth between the software and the hardware. Finally, Kehoe uses the DVD-ROM with her soon-to-graduate seniors. "I have them work through the program as a way to ensure that they are on track, to give them a little more practice before they go on their job interviews and have to show their stuff."

courses at the high school level. Labs may be purchased several ways: as content aggregates (such as genetics labs), as an entire set, or individually.

Contact: ***Benjamin Cummings Pub.,*** *San Francisco, CA; (415) 402-2500; www.biologylabsonline.com.*

JMP IN

JMP IN is the academic version of JMP 5.1, professional statistics software. JMP IN, available in early 2004, replaces JMP Academic. JMP IN is an intelligent, visual, interactive, and easy-to-use desktop application that allows students to learn statistical concepts quickly, and for instructors to spend more time teaching statistics and less time on software instruction. The JMP IN package includes a guided handbook of data analysis with JMP, all operating systems (Windows, Macintosh, and Linux) on one CD, and complete documentation. A four-year renewable license comes with the purchase. The new version offers a new design of experiments platform and new statistical platform, among other improvements. JMP IN will be distributed by Duxbury Press.

Contact: ***SAS Institute,*** *Cary, NC; (800) 874-2383; www.jmp.com.*

Mathematica for Students 5

Mathematica combines a numeric and symbolic computational engine, documentation system, graphics system, programming language, the world's most complete collection of mathematical functions, and advanced connectivity to other applications. Mathematica for Students 5 has the same powerful features as the professional version at about 10 percent of the price. Only enrolled students working toward a degree at an accredited institution may purchase the product at this reduced price. Depending on the user's level of expertise in mathematics, Mathematica can be a super-calculator or a computational powerhouse. It can handle complex equations involving millions of terms. It performs numerical modeling and simulations. It loads, analyzes, and visualizes data of any type, not just numerical data. It lets users create 2D and 3D animations and graphs, and has sound capabilities. Finally, it helps users to collect, synthesize, and present mathematical information for reports, lectures, or application development. The software is available in the following platforms: Windows 95/98/Me/NT/2000/XP, Mac OS 7.5.3 or later, Linux (PC, Power PC), and Mac OS X.

Contact: ***Wolfram Research,*** *Champaign, IL; (217) 398-0700; www.wolfram.com.*

MERLOT

The premier database for teaching resources, MERLOT (Multimedia Educational Resource for Learning and Online Teaching) is a consortium created by its contributors. Members and non-members alike can draw from its ever-expanding list of exercises, lectures, and applets. Browse by subject to find statistics resources. A free membership allows visitors to add their own teaching material to the database. Serving as a "gateway" to modular learning materials that faculty can incorporate into their own courses, MERLOT operates on the assumption that most faculty do not have the time to develop electronic content and are not interested in adopting a pre-packaged course. Further, the project rests on the belief that working in teaching and learning communities, going beyond the scope of an individual campus, increases the possibility of discovering the very best in teaching and learning materials and the best strategies available. Materials posted in MERLOT are for the most part, interactive simulations, animations, and tutorials that are peer-reviewed and tested in appropriate educational settings. Faculty members and students are also able to add their user comments to share their experiences with the learning material.

Visit ***www.merlot.org*** *for more information.*

Research Assistant Hyperfolio

Research Assistant Hyperfolio (RAHF) provides users with a "collection icon," a small, colorful button that appears on the browser screen. Users can capture anything found on the Web—including texts, images, video files, and audio files—by dragging-and-dropping it into the collection icon. The software then generates a Note Card that prompts students to complete three necessary research steps: take notes, record bibliographic information, and evaluate the source for relevance to the project. The software automatically adds the URL. In the second step of the research and writing process, students take the various note cards, now compiled into one data set, and outline a paper or presentation using the Worksheet feature. Again using drag-and-drop, or point-and-click, students organize and string together the appropriate material, pulling from the left side of the Worksheet (the note card information) to the open page on the right. The screen looks much like the split screen displayed when one calls up a Web search "history" in one's browser. The software will, on request, generate a complete bibliography in MLA, Chicago, or APA format. Students can work with multiple note cards and multiple worksheets simultaneously, for an array of organizational options. RAHF is available as a stand-alone product and also comes bundled with The Bedford Researcher, is a text, CD-ROM, and Web site product from Bedford/St. Martin's.

Contact: ***Bedford/St. Martin's****, Boston, MA; (800) 779-7440; www.bedfordstmartins.com.*

Virtual Biology Laboratory

Virtual Biology Laboratory (VBL) is a series of 30 exercises organized into 10 modules. These online laboratory simulations enable students to make comparative observations, set up experiments, acquire data, and draw conclusions on a variety of topics. Each exercise is accompanied by suggested activities, a worksheet, a self-test for each exercise and module, and an instructor's answer key. This set of online laboratory experiments is designed within a simulation format to enable students to actually "do" science by acquiring data, performing experiments, and using that data to explain biological concepts or phenomenon. Students can do all this while working from their school's computer lab, dorm room desktop, or home computer. Instructors can use the virtual lab experiments to supplement the experience of a "wet" lab and to introduce biology students to the same techniques and equipment currently being used in many research laboratories. Online labs allow students to "use" expensive or otherwise unavailable laboratory equipment or supplies.

To see descriptions and/or demos of the 10 modules, visit: www.brookscole.com/biology_d/vbl/.

Zettl's VideoLab 3.0

Intended for courses in video or television production, Zettl's VideoLab 3.0 is the fully updated version of an award-winning DVD-ROM that brings a virtual video production studio right to the students' computer desktop. Students get hands-on video production experience introducing them to the principles of camera, lighting, audio, switching, editing, and process. This stand-alone, interactive DVD-ROM uses demonstrations and guided practice to teach students the basics of the video production process. The software, which can be used in conjunction with a textbook or by itself, establishes a scenario in which the student plays the role of a video production intern, learning the basics of production planning, camera use, lighting, audio, and editing. Version 3.0 includes enhanced interactivity, more material on studio lighting, and more options for exploring audio and video techniques.

Contact: ***Wadsworth Publishing****, Belmont, CA; (800) 423-0563; www.wadsworth.com.*

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Course Management Systems

Course management systems are the enterprise resource planning tools of the classroom, managing everything from curriculum, assignments, examinations, group projects, grades, to general classroom communications. These tools are growing in sophistication. Moreover, like most enterprise software, CMS is eyeing distant shores. Home of campus records both in the administration building are both academic and personal. More and more, CMS developers are looking to tie together the academic and administrative enterprise with modules and extensions for such features as data analysis, enrollment, and targeted messaging.

Angel from CyberLearning Labs

CyberLearning Labs offers Angel, an easy-to-use, practical course management, and collaboration portal solution. Angel is designed so that instructors with little or no training can quickly develop online course materials, exercises, and tests, pulling in material from files, complex images, sets of Web pages, content developed in other CMSs, and publisher-developed content. Lessons can include some or all of these content types. The HTML editor FASTpage publishes new content directly to the Web—recognizing spelling errors as well as scientific and mathematical symbols. The upload utility recognizes zipped files and offers to unzip them—eliminating another step for the user.

Normal and advanced modes accommodate all levels of user experience. In addition to its course management functions, Angel also serves as a portal and communication tool. Users can customize their Web space with bookmarks, calendars, and task lists. Schoolwide, group, and individual posting options are inherent in the package.

Contact: ***CyberLearning Labs****, Indianapolis, IN; (317) 860-3810; www.cyberlearninglabs.com.*

Blackboard's Content Management Solution

Blackboard's Content Management Solution offers a new level of functionality, beyond the learning management system most users are familiar with. The focus is on creating, reusing, and presenting digital content. The central component of the Content Management System is the Core Content Repository, which stores linkable, reusable content objects, controls access to these objects, and provides scalable, robust features for effectively managing them. A browser-based interface (like Internet Explorer) allows users to browse, access, and share content, as well as search, link, and reuse content created by themselves or others. Searching and collaboration tools are inherent to the product, as are controls over security, access, permissions, and bandwidth settings. The four crucial aspects of the system are: Learning Content Management, for sharing and reusing single files or large volumes of content assets; ePortfolios, allowing students and faculty members to assemble, present, and share information online for documenting academic growth, career evaluation, and course preparation; Virtual Hard Drives, for storage; and Library Digital Asset Management, which creates an interactive environment for faculty to search, access, and incorporate digital library resources in course preparation.

Contact: ***Blackboard****, Washington, D.C., (202) 463-4860; www.blackboard.com.*

"Searching and collaboration tools are inherent to the product, as are controls over security, access..."

eCollege

As an integrated product and service provider, eCollege focuses on a comprehensive package of services, software, and technology for full online programs. eCollege tailors its Course Management System and Program Administrative System solutions to each customer's requirements. However, the basic eCollege package includes a campus portal system, eCollege's course management system, an online evaluation component, continuously available help desk support, and administrative support.

This year, eCollege announced several new advancements. ExamGuard, an integrated secure browser developed with Questionmark technology. ExamGuard allows students to launch an exam within a secure browser without having to leave their course in order to do so.

The latest version of eCollege's course management system is eCollege AU+, which includes such unique course management features as an assignment dropbox and equation builder. The dropbox is a series of baskets into which students deposit their work. Offering multiple baskets that are integrated with the gradebook allows instructors to more easily review, comment, and grade from a single location in the platform. The equation builder, developed on Design Science's WebEQ technology and integrated into the eCollege AU+ system, enables users to build and edit mathematical equations directly through the course-authoring environment with one-click access. In other words, there's no longer a need to build the equations in a different application and then import them into the course management software.

New eCollege AU+ Authoring enhancements enable faculty to hide certain content from student view, print or save threaded discussions offline, and determine exactly when to display and withdraw announcements on the course home page. Also, new this year is an

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enhanced eCollege Gradebook, the Company's first full Microsoft .NET implementation. The eCollege Gradebook is closely integrated with all aspects of an online course for highly efficient and convenient grading and instructor feedback.

eCollege also announced the next generation of its Program Administration Solultions (PAS). Enrollment reporting is available offline via Microsoft Excel for dynamic analysis and distribution of the data; messaging (including file attachments) can target users by organization (e.g., region, campus, school, department, program, etc.); and reporting data is displayed with enhanced navigation in a paged format for ease of use.

Contact: ***eCollege****, Denver, CO; (888) 884-7325; www.eCollege.com.*

Jenzabar Learning Management System

Part of its Internet Campus Solution, which also includes portal and administrative components, the Jenzabar Learning/Course Management System offers powerful and easy-to-use course management tools for supplementing courses and tools for one-stop academic life management for students. Features include a personal calendar (pre-populated with course information); group areas for enhanced course interaction; easy customization and management of course content; easy upload/download of electronic documents including syllabi, text handouts, PDFs, audio and video file formats, and images; discussion Forums for asynchronous communication; chat rooms for real-time collaboration; grade book and attendance tracking; and online test creation and administration. Also, Jenzabar's Course Management features password-protected, 24/7, single-login access.

Contact: ***Jenzabar****, Cambridge, MA; (877) 526-0222; www.jenzabar.com.*

SCT Luminis Product Family

The SCT Luminis product family is the market-leading family of platform, portal, content management, and data integration products for higher education. Through new SCT Luminis data integration technologies, clients can more easily integrate their choice of learning management system with their SCT administrative system. The SCT Luminis Platform III also includes its own set of course tools that are integrated at the data and application level to help institutions streamline communications, simplify eLearning, and create customized forums that enable campus groups to interact and collaborate online. SCT Luminis Course Studio includes course calendars, restricted chat, message boards, and photos. New functionality includes automatically populated course e-mail lists, file sharing, targeted announcements, and the ability to delegate authority over course resources to class participants beyond the professor.

Contact: ***Jenzabar****, Cambridge, MA; (877) 526-0222; www.jenzabar.com.*

SCT PowerCAMPUS

SCT PowerCAMPUS is an administrative system designed to support the unique needs of smaller institutions. SCT PowerCAMPUS is now IMS compliant, enabling clients to export information about courses and students from the SCT PowerCAMPUS system to any learning management system that is IMS compliant. SCT PowerCAMPUS also provides its own course tools. The enhanced course manager allows faculty to copy media files and grading activities from one course section to another course section that they teach. An enhanced grade book allows faculty to set up grading schemas by activity type with an average scale or a total points scale. For example, faculty can define that quizzes count for 30 percent of the final grade. The grade book also allows faculty to view statistical information such as the average, standard deviation, variance, or high and low grades for each course activity, as well as the midterm and final grades.

Contact: ***SCT****, Malvern, PA; (800) 223-7036; www.sct.com.*

WebCT Campus Edition 4.1

This latest version of the popular course management system from WebCT offers new features and functionality designed to make Campus Edition even more user friendly. Version 4.1 includes new course design wizards, providing step-by-step guides that walk faculty and course designers through the completion of common course tasks, including setting up their course Homepage, Syllabus, Organizer Pages, Content Modules, Discussions, Mail, Calendar, and Chat. The look of the product is new as well. Version 4.0 has been updated throughout and controls have been grouped and positioned to facilitate easier access and more efficient course design. Additionally, the designer interface has been divided into tabs that clearly separate the student and the designer views, making it easier to design and preview courses.

WebCT Campus Edition 4.0 makes it possible to create content modules offline using applications such as Microsoft FrontPage and Microsoft PowerPoint, and to directly import these objects into WebCT, with all of their structure and linking intact. Learning objects, including both content modules and the assessment suite, can also be tagged and exported for storage or re-use. WebCT Campus Edition 4.0 includes an HTML Editor with spell-check, providing course

"The enhanced course manager allows faculty to copy media files and grading activities from one course section to another course section..."

designers with "What You See is What You Get" (WYSIWYG) content creation and editing capabilities, making it easier than ever to create and maintain content within the WebCT course environment.

Now with version 4.1, instructors can import ePacks into their existing courses without over-writing their own content, which gives instructors the flexibility to move between publisher content and their own materials.

Contact: ***WebCT****, Lynnfield, MA; (781) 309-1000; www.webct.com.*

Unicon Academus Course Management

Academus Course Management is built as a uPortal application and delivers the framework, software, and services needed to establish a complete online campus—powering instructional delivery and tracks the online learning experience as an integrated component of the Academus Suite. Academus puts course participants in control of their own learning experiences—including an intuitive console of learning channels and a user-friendly interface. Academus Course Management provides utility, control, and automates the administration of learning events from the initial assessment to the final report. Built on the uPortal open standards framework, from JA-SIG, Academus provides a scaleable and flexible Web-based solution—tested for compliance with the provisions of the Americans with Disabilities Act Section 508.

Contact: ***Unicon****, Chandler, AZ; (408) 926-2368; www.unicon.net.*

PCs, Workstations, and Notebooks

Choice is the name of the game in desktop computing. Although each maker continues to offer specific product lines, within each family the individual models are completely customizable. The buyer can choose not only how much power and memory the new purchase will supply, but also what expansion slots, peripherals, and drives it will have. The downside of this plethora of options, of course, purchasers have to compare and contrast even more carefully in order to get the most appropriate product. For our roundup, we've identified models that are suitable for rigorous use in the instructional setting. Each of these models, with the components described here, carries a moderate list price depending on options selected. However, because the options you choose will affect the cost of the model you buy, we haven't included prices in the chart below.

Workstations

HP Workstation xw6000

The HP Workstation xw6000 replaces the Compaq Evo W6000. It features a choice of preinstalled operating systems: Microsoft Windows XP Professional, Microsoft Windows 2000 Professional, or Red Hat Linux 7.3. With two Intel Xeon processors, the workstation operates at speeds up to 3.20GHz. Also included is an Intel E7505 chipset enabling AGP 8X Pro 50, dual-channel DDR SDRAM, 533MHz system bus, and USB 2.0, up to 8GB of PC2100 ECC Registered DDR SDRAM 266 memory (greater than 4GB available on Linux only), five bays, five slots, integrated Ultra ATA/100 controller and dual-channel Ultra 320 SCSI controller, integrated Broadcom network connection; 10/100/1000Mbs LAN data rate, mass storage expandability up to 500GB Ultra ATA, 438GB Ultra 320 SCSI, or optional 160GB Serial ATA (320GB Serial ATA available in select regions). An NVIDIA Quadro FX 3000 graphics card is now available with this workstation.

Contact: ***Hewlett Packard****, Palo Alto, CA; (650) 857-1501; www.hp.com.*

IntelliStation M Pro

The IBM IntelliStation M Pro is a flexible workstation that is optimized to the demands of engineers, media creators, software developers, and financial analysts. Features include a task-tuned 2D/3D graphics and a flexible six slot, seven bay mini-tower design. Additionally, this package comes equipped with Pentium 4 processors at up to 3.2GHz, an 80GB hard disk, and up to 1GB of memory. It comes preloaded with a Windows XP Professional operating system.

Contact: ***IBM****, Armonk, NY; (800) SHOP-IBM; www.ibm.com.*

Octane2

The Silicon Graphics Octane2 is a multimedia workstation capable of interactive rendering of three-dimensional or volumetric data sets, featuring high-performance VPro Graphics and 128MB of configurable graphics memory. The combination supports faster drawing, display, and manipulation of large data sets-up to 1920x1200 pixels at 60Hz. Designed for high performancewith big data, the Octane2 delivers a measured 448 million pixels per second with trilinear mipmapping and depth-buffering, and 18 million lit depth-buffered, smooth-shaded immediate mode triangles per second. The 12-bit per color component path achieves more levels of color to allow users to see subtle variations-extremely important in medical imaging and other fields of science and research. Octane2 was awarded the top Platinum Award from AV Video Multimedia Producer magazine in 2002.

Contact: ***Silicon Graphics****, Mountain View, CA; (800) 361-2621; www.sgi.com.*

Products	Processor	Operating System	Hard Drive	Memory	Drives	Graphics	Monitor
Gateway 710 Series 710X	Intel Pentium 4 3.0 GHz	Windows XP Home Edition	160GB	512MB	DVD-R/ RW/CD-RW and CD-RW	128MB ATI Radeon 9600G	17" Flat Panel
Dell Dimension 8300	Intel Pentium 4 3.2 GHz	Windows XP Home, Professional, or Media Center	40GB	2GB dual channel	48x CD-ROM a nd 3.5" floppy	256MB DDR ATI 9800 XT	19" CRT
HP d530 Convertible Minitower with Hyper-threading	Intel Pentium 4 2.40GHz	Windows XP Professional SP1	40GB	Up to 4GB	48x CD-ROM removable floppy	1GB DDR PC2700	None
Power Mac G4	1.25GHz	Mac OSX	80GB	Up to 2GB	DVD-ROM/CD-RW combo	4x AGP graphics	None
Compaq Presario 8000T	Intel Pentium 4	Windows XP Home or Professional Edition	80GB	512MB DDR up to PC3200	16x DVD-ROM 4x DVD +RW/+R Removable floppy drive	128MB DDR ATI Radeon(R) 9200 with TV out	None
IBM NetVista M Series M42	Intel Pentium 4	Windows XP Professional	40GB	2GB	CD-ROM 48x	64MB ATI RADEON 9200	None

Table 3: Selected Computer Platforms

Notebook Computers

Compaq Presario Widescreen Notebook X1000

The Compaq Presario Widescreen Notebook X1000 PC features a high-resolution 15.4-inch wide aspect ratio display that is 20 percent brighter, features 33 percent wider viewing angles, and includes an improved contrast ratio compared to traditional notebook displays. To meet the needs of multimedia users, the Presario X1000 is available with ATI's Mobility Radeon 9200 graphics with 64MB video memory, JBL Pro speakers, and three USB 2.0 ports. Equipped with Intel Centrino mobile technology, the aluminium-covered Presario X1000 is 1.3-inches thick and weighs 6.5 pounds.

The Pentium-M processor designed specifically for mobile computing, the X1000 notebook can achieve up to 5 hours of battery life. The notebook's integrated Intel PRO/Wireless 2100 LAN card provides the foundation for clear and compatible connections across 802.11b Wi-Fi (wireless fidelity) networks. Optional integrated Bluetooth wireless connectivity allows users to synchronize and share their data with other Bluetooth enabled devices, such as HP iPAQ Pocket PCs, HP mobile printers or cell phones, to create their own personal area networks.

Contact: ***Hewlett Packard****, Palo Alto, CA; (888) 999-4747; www.hp.com.*

Dell Latitude

Dell's new line of notebook computers, the Latitude, offers a silver chassis and integrated wireless networking technology. Two models—the D600 and the D800—are good bets for higher education users. An improved layout provides easy access to the side module bay, and the smart-port location simplifies cable management. The lightest weight model, the D600, weighs 4.68 pounds. The D800 weighs 7.0 pounds.

Standard to each model is QuickSet, a customizable software application that allows users to easily control power management settings, monitor system status, enlarge icons for high-resolution displays, and more.

The D-family notebooks utilize a bottom docking port, allowing users to elevate the notebook display to eye-level and making an external monitor optional. They also include integrated smart card and Gigabit Ethernet capability and dual-band (2.4GHz and 5GHz) wireless antennas. Bluetooth connectivity is optional. Both the D600 and the D800 feature come equipped standard with Intel's Centrino Mobile Technology, featuring Intel's new Pentium M processor. Customers can also choose Dell's TrueMobile 1300 (802.11b/g) or the TrueMobile 1400 (802.11a/b/g) wireless solution. The D800 features 128MB to 2GB of 266MHz DDR SDRAM (PC2100) memory and a 15.4-inch screen. The D600 features 128MB to 2GB of 266MHz DDR SDRAM (PC2100) memory and a 14.1-inch screen.

Contact: ***Dell****, Round Rock, TX; 888-987-3355; www.dell.com.*

Gateway 200 and 450 Notebooks

A slim and light notebook for educators needing maximum mobility, the Gateway 200 combines powerful computing with built-in Intel Centrino wireless connectivity. As the lightest notebook in Gateway's line at just over four pounds, the 200 features a 14.1 inch XGA screen, Intel Pentium M processor 1.6GHz, 512MB of DDR SDRAM, a 40GB hard drive and an integrated DVD-R/-RW/CD-RW recorder. The Gateway 200 also offers a built-in PC card slot, FireWire port, S-Video port, and two USB 2.0 ports.

Gateway's mid-range 450 notebook blends price, performance, and portability. With extra-long battery life exceeding four hours, the 450 offers an Intel Pentium M processor 1.6GHz, 512MB of DDR SDRAM, a 40GB hard drive and modular DVD-R/-RW/CD-RW recorder (modular means that it can be replaced with other optical drives if needed). The 450 features two Type II or One Type III PC Card slots, two USB 2.0 slots, one FireWire port, and parallel, serial, and PS/2 slots. The 450 features a 15-inch screen and 64MB of DDR video memory. For educators that need to stay connected when away from the classroom, the Gateway 450 has an integrated V.92 56K modem and 802.11b wireless networking featuring Intel Centrino technology.

Contact: ***Gateway****, Poway, CA; (877) 487-1129; www.gateway.com.*

HP Pavilion zd/7000

The HP pavilion zd7000 notebook PC is a high-performance wireless notebook that incorporates a high-resolution 17-inch wide screen display. New HP Image Zone software allows users to easily find, organize, and share digital photos and automatically preserves and protects the images. The zd/7000 features an Intel Pentium 4 processor with HT (Hyper-Threading) Technology and an 800MHz system bus for improved responsiveness and performance, 128 to 512MB DDR SDRAM memory, an expanded keyboard with numeric keypad, a 5-in-1 Integrated Digital Media Reader for fast, easy transfer of images, and support for 802.11g or 802.11b wireless networking. Bluetooth connectivity is optional.

Contact: ***Hewlett Packard****, Palo Alto, CA; (888) 999-4747; www.hp.com.*

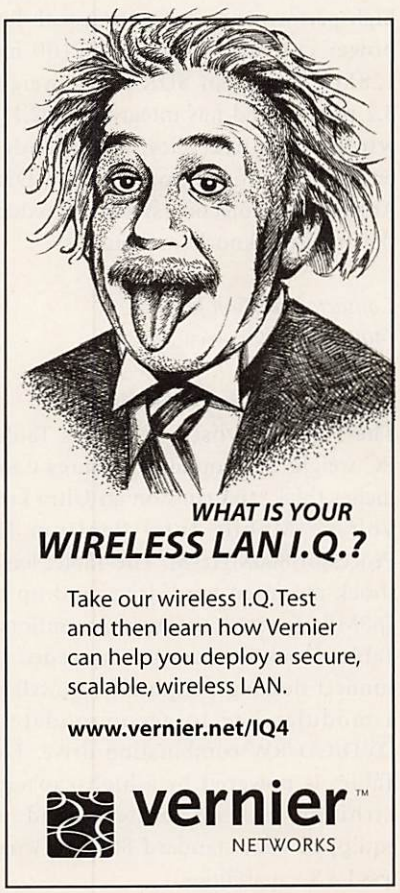
IBM ThinkPad R40

The ultra-portable IBM ThinkPad R40 weighs 5.6 pounds and comes equipped with a 1.80GHz Intel Celeron or 1.30 Pentium MGHz processor, 256MB memory and 20-40GB hard drive. The model promises four hours of battery life. The R40 offers both Wi-Fi 11b and 11a solutions; customers choose based on their preferences.

The R40's Access Connections technology simplifies the process of moving between wired and wireless connections. After users create profiles for the various places and ways they connect to the Internet, the ThinkPad R40 notebook detects a wired or wireless LAN connection and switches between these profiles based on priority or speed. This allows users to move from a home or office wired LAN connection to a wireless LAN hotspot in the library or conference room without manually switching profiles.

The ThinkPad R40 notebook provides secure wireless connectivity through the IBM Embedded Security Subsystem (ESS), which protects users' personal data and intellectual property. It also offers the new Access IBM button, a "portal to IBM support" that taps into a rich set of onboard resources, diagnostic tools, automated solutions, updates, and online services. Rapid Restore PC, which provides one-button disaster recovery and restores data, settings and applications after a software failure, is also featured on the R40. Both Access IBM and Rapid Restore PC limit downtime, maximizing productivity.

Contact: ***IBM****, White Plains, NY; (888) SHOP-IBM; www.ibm.com.*


WHAT IS YOUR
WIRELESS LAN I.Q.?
Take our wireless I.Q. Test and then learn how Vernier can help you deploy a secure, scalable, wireless LAN.
www.vernier.net/IQ4
vernier
NETWORKS

Tablet PCs and Other Portable Devices

The Tablet PC allows users to be productive in more situations. Somewhere between a notebook and a PDA, Tablet PCs have found their niche. A smaller niche belongs to specialty products such as AlphaSmart and Dreamwriter, which provide simple, low-cost alternatives to more robust technology tools. Whatever you choose, mobile computing has the capability to expand your productivity horizons.

Acer TravelMate Convertible C100

The Acer TravelMate Convertible C100 Tablet PC is an ultra-portable convertible notebook that transforms from clam-shell to Tablet mode by twisting the LCD panel. It's powered by the Ultra Low Voltage Mobile Intel Pentium III Processor-M, which is optimized for high-performance computing with low power consumption. The C100 has 128MB/256MB of SDRAM. It weighs 3.2 pounds and has integrated 802.11b wireless connectivity, an extended battery life of 3.5 hours, and a Disc Anti-Shock Protection system, to reduce the impact of knocks and bumps.

Contact: ***Acer****, San Jose, CA; (408) 432-6200; www.acer.com.*

Fujitsu Stylistic ST4000

The Fujitsu Stylistic ST Series Tablet PC weighs 3.2 pounds, measures 0.88-inches thick, and runs on an Ultra Low Voltage Mobile Intel Pentium III Processor 800MHz-M. The Tablet has a shock-mounted hard drive, and up to 768MB of system memory. An optional Tablet Dock features ports needed to connect desktop peripherals, as well as a modular bay to accommodate a DVD/CD-RW combination drive. The Tablet is powered by a high-capacity Lithium six-cell battery and is equipped with standard 802.11b wireless LAN capabilities.

Contact: ***Fujitsu****, Sunnyvale, CA; (408) 737-5600; www.fujitsu.com.*

HP Tablet TC1100 WXP PC

HP's TC1100 WXP Tablet PC measures .8-inches thick, weighs three pounds, and includes: an Intel Celeron or Pentium M processor; a 10.4-inch TFT display featuring a wide 160-degree viewing angle, hardened cover glass, built-in 802.11b wireless LAN capabilities, up to 60GB hard drives, and USB 2.0 connectivity. A battery-free digital pen supports pressure-sensitive applications.

Contact: ***Hewlett Packard****, Palo Alto, CA; (888) 999-4747; www.hp.com.*

Motion Computing M1200 Tablet PC

Motion Computing's M1200 Tablet PC weighs less than three pounds in a base configuration. The clipboard-sized design, with a slate form factor, is engineered for mobility. It features a 12.1-inch XGA display that is 35 percent larger than a conventional 10.4-inch screen. The M1200 can be adapted for conventional desktop use with a selection of peripherals such as a keyboard, mouse, and docking station. The wireless 802.11b standard is built-in to the unit, which has a memory capacity to 1GB and hard disk drives from 20GB, 40GB or 60GB. The system is powered by Intel's ultra-low voltage 866MHz Mobile Intel Pentium III Processor-M.

Contact: ***Motion Computing****, Austin, TX; (512) 637-1100; www.motioncomputing.com.*

Toshiba Portégé 3500 Series Tablet PC

Toshiba's Portégé 3500 Series Tablet PC convertible weighs 4.1 pounds and features an 802.11b Wireless LAN Module, integrated Wi-Fi antenna, Bluetooth wireless connectivity options, and 10/100 networking. The Tablet includes an Intel Pentium III-M processor, 1.33GHz, Secure Digital (SD) Media slot as well as integrated CompactFlash to maximize workforce productivity. The Portégé includes the Zinio Reader, which brings a digital magazine on screen, and Sensiva's Symbol Commander, offering end users a natural way to use their device by drawing symbols with the pen.

Contact: ***Toshiba America****, Irvine, CA; (800) GO-TOSHIBA; www.toshiba.com.*

ViewSonic Tablet PC V1100

ViewSonic's Tablet PC V1100 uses the Mobile Intel Pentium III Processor-M at 866MHz, along with 256MB RAM, 20GB hard drivem and a 56Kbps modem. It features a full-color, 10.4-inch display and up to a three-hour battery life, weighs just three pounds, and is less than 1-inch thick. The system comes with embedded 802.11b wireless connectivity, and an optional dock adds one-touch access to common USB peripherals, and local area networks. A suite of accessories includes an extended battery, battery charger, USB keyboard, and handgrips for added protection.

Contact: ***ViewSonic****, Walnut, CA; (909) 444-8888; www.viewsonic.com.*

Xplore iX104-TPC, Rugged Tablet PC

The Xplore iX104-TPC is a ruggedized Tablet tested around military standards (MIL-STD 810F) for harsh outdoor or mobile environment extremes. The 4.5-pound system has a sealed magnesium housing, a removable bumper protection system, a 10.4-inch XGA Hi-Brite color LCD, Wacom Pen-enabled Sensor technology, lithium polymer phosphate batteries, dedicated, programmable function keys, sealed on-board ports, and options including GPS receiver, and video camera. The Tablet integrates a Mobile Intel Pentium III Processor-M at 866MHz, a supporting Intel 830 chipset, a 133MHz system bus, and 512KB L2 cache. The iX104-TPC TPC has embedded Bluetooth capabilities in addition to multiple wireless radio bays to accommodate Wireless LAN.

Contact: ***Xplore Technologies****, Austin, TX; (888) 449-7567; www.xploretech.com.*

AlphaSmart 3000

The AlphaSmart 3000 allows users to enter and edit text, then send it to any computer for formatting or directly to a printer. Its portability allows students to use it anywhere and anytime—in the classroom, at home, or on field trips. Its low price is attractive in situations where budget constraints may force an institution to choose between outfitting all students or providing systems to be shared. The AlphaSmart 3000 can run for 700 hours on three AA batteries and it weighs only two pounds. With mini-applications, or applets, word processing, calculator functions, keyboarding instruction, classroom quizzing, outlining, and word prediction are available.

Contact: ***AlphaSmart****, Los Gatos, CA; (408) 355-1000; www.alphasmart.com.*

Dreamwriter

The DreamWriter 500 is a full-featured word processor with a laptop design. Users have access to full text styling such as bold, underline, superscript, expanded, and a large font. Also included is a built-in spell checker and thesaurus. The backlit screen is adjustable between 8 to 16 line display, making it a good match for special needs students. And its storage capacities—including a floppy drive—enable students to easily transfer their work to computers located at home or in other classes. The product weighs 2.2 pounds and can run for 13 hours without a battery recharge.

Contact: ***Dreamwriter****, Maple Ridge, British Columbia, Canada; (800) 663-7163; www.dreamwriter.com.*

Products	Processor	Memory	Installed Applications	Keyboard	Camera	Integrated Wireless	Display	Features
Palm Tungsten C www.palm.com	Intel PXA 255 400 MHz	64MB	VersaMail 2.5, DataViz Documents to Go	Built-in	No	802.11b	320x320 Transflective TFT color screen	Built-in PPTP virtual private network
Dell Axium x5 www.dell.com	Intel Xscale up to 4003MHz	64MB	MS Pocket PC 2003 Premium Suite	Optional foldable external keyboard or snap-on thumb keyboard	No	802.11b and Bluetooth	3.5" QVGA TFT color 16-bit, touch sensitive Transflective	Scroll dial for one-handed operation
Handspring Treo 600 www.handspring.com	144MHz ARM	32MB	Contact List/ Calendar, SMS, MMS/Picture Mail, Blazer Web Browser, To Do List, Memo Pad, Calculator, etc.	Full QWERTY keyboard	Built-in with picture caller ID	No	Bright CSTN Backlit display	Full-featured phone and web browser that can surf Java sites
HP iPAQ h2210/2215 www.hp.com	Intel 400 MHz with X-Scale PXA255	64MB	MS Pocket PC 2003 Suite	Pen and touch interface	No	Bluetooth, plus ready to add wireless expansion card	Transflective 3.5" TFT liquid crystal display with LED backlight, 64K colors 16-bit, 240 x 320 resolution	Nevo universal remote control software for checking home and office
Sony Clie PEG-UX50 www.sonystyle.com	Pentium II 400 MHz	104MB	Palm OS 5 with Palm Organizer Applications, plus additional apps	Touch screen or keyboard	Built-in 310K pixel camera	Bluetooth and 802.11b	Wide-screen lifts to expose keyboard or swivels out of the way to form a touch screen	Embedded Wi-Fi signal detection technology and MP3 player
Blackberry 7230 Wireless Handheld www.blackberry.com	N/A	16MB	Blackberry Desktop Software, including calendar, address book, task list, etc.	Backlit QWERTY keyboard	No	Embedded wireless connectivity, always on feature	High Resolution 240x160 display supporting over 65,000 colors	Trackwheel and integrated phone

Table 4: Handhelds and PDAs

Productivity Tools

Productivity tools come and go, but the good ones keep getting better. In many cases, tools that were designed originally for the single-user desktop application have developed new versions or spin-offs for the enterprise. Many of the tools below have been covered in *Syllabus* in previous versions. Below is an update on the latest productivity toolmakers.

AcqURL

This bookmark management tool (pronounced like "a-squirrel" without the "s") features a variety of options for handling large collections of Web bookmarks. AcqURL uses a tabbed page metaphor to access groups of bookmarks, with each page holding up to 80 bookmarks and the number of pages virtually unlimited. Bookmarks can be added to AcqURL simply by clicking the mouse on any blank bookmark button. Local applications, such as a word processor, can also be loaded and launched from AcqURL. AcqURL also contains an integrated FTP client with drag-and-drop functionality for bookmarking FTP sites. Users can identify specific bookmarks by color coding them or assigning icons. AcqURL will automatically use the icon of a local file type when bookmarkng local files, and look for a Web page icon when bookmarking Web pages. Icons can also be assigned to AcqURL bookmarks and can use various graphic types such as: BMP, GIF, JPG, ICO, and ICL.

Contact: ***GT Technologies****, Bend, OR; (541) 389-6628; www.acqurl.com.*

AutoDialogs

AutoDialogs is a Windows95/98/NT/2000 program that was developed to provide quick access to the folders used most often in standard Open/Save as/Browse for folder dialogs (including Office 95/97/2000 and Windows 2000 Professional dialog boxes), Windows Explorer and other programs. Using AutoDialogs, users can automatically insert pre-selected folders into their dialog boxes using a system tray menu (requiring only 2 clicks) or a pre-assigned hot key (one keystroke). The new version, free to current users, introduces better AutoDialogs menu organization, better Properties dialog, and a detailed Tutorial.

Contact: ***MetaProducts****, Columbus, OH; www.metaproducts.com.*

Iopus E-mail BEEE

Iopus E-mail BEEE is a utility that automates the vast majority of e-mail tasks. This "E-mail-Bee" lets users automatically e-mail designated files or folders at specified time intervals. Users simply to select the file to be sent, add e-mail information, and the time interval to send the file. Additionally users can specify the criteria that should be met (send it always, only if changed, or if it has grown by a specific amount of bytes). The program handles the connection to the Internet service provider and sends the file via e-mail. BEEE can automatically zip compress the files before sending, making the mailing of even large files a snap.

Contact: ***iOpus****, Walldorf, Germany, (49) 6227-841-9604; www.iopus.com.*

iMarkup Server

The iMarkup Server is an enterprise solution with integrated workflow, document management, document imaging, and knowledge management. The iMarkup Server transforms document-based information into knowledge assets by providing powerful storage, categorization, and search technologies. It provides users with an easy way to manage, distribute, locate, collaborate on, annotate documents, review documents and digital content. It supports users in all stages of the document lifecycle.

The iMarkup Server provides document management, workflow automation, document imaging or scanning, Web collaboration, and knowledge management needs. The iMarkup Server is an "out of the box" product that is easy to install and administer.

Contact: ***iMarkup****, Vista, CA; (877) MARKUP-1; www.imarkup.com.*

MacDrive 5

MacDrive 5 enables computer users to navigate seamlessly between Mac and Windows platform documents without loss of productivity. With MacDrive 5 installed, users can use Windows Me, 98, 95, NT 4.0, 2000, or XP and seamlessly access Mac disks of all types, including floppy, Zip, Jaz, CD-ROM, CD-R, and hard drives. Users can open, save, delete, rename, and even format Mac disks on a Windows PC. MacDrive works on floppies, Zip, Jaz, ORB, SyQuest, hard drives, CD-ROMs, multisession CD-Rs, and others.

Contact: ***Mediafour Corp.****, West Des Moines, IA; (515) 225-7409; www.mediafour.com.*

QuickConference

QuickConference from CE Software provides instant communication to networked users of Microsoft's Windows 95 or greater, Windows NT 4.0 or greater, and Apple's Mac OS. Unlike other instant messaging products, everyone can use QuickConference, even those without a connection to the Internet. This easy to use conferencing product features secure messaging, URL and e-mail support, server linking, custom address books, and multi-user logins. This quick and secure tool is an appropriate solution for office environments.

Contact: ***CE Software****, Des Moines, IA; (515) 221-1801; www.cesoft.com.*

StuffIt Deluxe

Aladdin Systems' StuffIt software is a complete compression solution that enables users to share large files faster through the Internet. Files can be compressed by 98 percent of their original size, freeing up hard drive space and saving time sending and receiving files. The software works on Mac, Linux, and Windows platforms. Stuffit Deluxe allows users to compress and mail from Word, Excel, Outlook, or PowerPoint; exchange files with anyone, regardless of the platform; automate data backups; and find compressed files without having to expand the archive. New to version 8.0 are a drag-and-drop interface, wizards, and support for .rar and .tar files.

Contact: ***Aladdin Systems****, Watsonville, CA; (831) 761-6200; www.aladdinsys.com.*

Timbuktu Pro

Timbuktu Pro for Windows is a remote control and file transfer software solution. Multiple Access Mode technology supports all Internet, local area network (LAN), wide area network (WAN), dial-up, and direct dial connections. Timbuktu Pro ensures that any mobile worker, telecommuter, or offsite collaborator can connect and communicate without fail across all Windows and Mac OS platforms. Timbuktu Pro Enterprise is a scaleable, multiplatform solution for user support, systems management, telecommuting, and collaboration across a LAN, WAN, the Internet, or dial-up connections. With Timbuktu Pro Enterprise, systems administrators and network management personnel can control remote machines on the enterprise network to perform complete evaluations, diagnosis, and troubleshooting.

Contact: ***Netopia****, Emeryville, CA; (510) 420-7400; www.netopia.com.*

Now Up-To-Date & Contact Software 4.0

The latest version of this software for personal organization allows users to organize their schedules and contacts, then keep it all "Up-to-Date" by issuing reminders, making it easy to change and add information. The software is synchronizable with a Palm compatible computer. Users can manage their own schedules and contacts, or easily share them with small groups or large organizations. Now Up-to-Date & Contact's built-in server solution lets users schedule meetings inside a small office or run a worldwide enterprise over the Internet. New features include Grab-n-Go, with which users can collect information from virtually any document and with one click, create an appointment, to-do, or reminder.

Contact: ***Power On Software****, New Albany, OH; (800) 344-9160; www.poweronsoftware.com.*

Vista Plus Suite

Vista Plus software from Quest allows administrators to manage all of the information in an organization, save it in a central repository, and deliver it to users in a variety of formats. Vista provides access to files through portals and e-mail, and reduces cost of ownership through its powerful search tools and report index hyperlinking drill-down capabilities. It enables self-service access to reports and statements over intranets or extranets, and provides page-level security to protect sensitive report content. Using Vista Plus eliminates hard-copy report distribution and simplifies administration.

Contact: ***Quest Software****, Irvine, CA; (949) 754-8000; www.quest.com.*

VMWare Workstation

VM Ware Workstation creates virtual computing worlds—multiple operating systems can be run on the same workstation. How does it work? The additional operating systems are running in secure virtual machines that co-exist on a single piece of hardware. The result is cost savings and the ability to use one computer to run both legacy systems and new operating systems.

Contact: ***VMWare****, Palo Alto, CA; (877) 486-9273; www.vmware.com.*

Syllabus 2004

July 18 - 22, 2004, Hyatt Regency Embarcadero, San Francisco

CALL FOR PAPERS

Syllabus2004 will feature informative sessions relevant to technology for higher education. College and university IT directors and their staff, administrators, instructional technologists, faculty, and others involved in implementing or using technology will want to participate.

The five-day event will incorporate a range of session types, from in-depth skill development workshops to highly strategic panel discussions and visionary keynotes. Breakout sessions will be offered in five timely conference tracks, and poster sessions will provide an opportunity for face-to-face interaction.

In view of a normally large response to the Call for Papers for our annual summer event, we encourage you to submit your proposal well in advance of the due date of January 5, 2004.

CONFERENCE CONTENT - TRACKS

In five conference tracks, we examine the central themes and key technologies that have become increasingly critical to informed decision makers and faculty in higher education. Some overlap among the tracks is natural, so feel free to choose one or two tracks into which your proposal will most likely fit.

TRACK 1 - NEW TECHNOLOGIES AND TRENDS

From handheld computers to tablet PCs, ePortfolios, and new high-tech tools for instruction, this track samples the new and emerging technologies and applications that are sure to make a difference in the development and delivery of education.

- High-tech tools for instruction
- ePortfolios
- Tablet PCs
- Handheld devices and PDAs
- Wireless instruction
- New publishing technologies
- Smart buildings and classrooms
- Collaboration technologies
- Trends in personal computing
- Voice recognition
- Mobile computing
- Advanced networking applications

WATCH FOR CONFERENCE UPDATES AT WWW.SYLLABUS.COM

TRACK 2 - INTERACTIVE MEDIA

With today's interactive media, educators can employ new strategies to support teaching and collaborative learning. Streaming technologies, Web casting, and interactive Web sites are being leveraged for efficient and effective content delivery. This track examines how interactive technologies are being used in the classroom, the lab, and for distance education, and highlights the enabling technologies and standards that help make it all possible.

- Simulations and virtual reality applications
- Web design
- Interactive labs
- Human-computer interface
- XML in education
- Web-based image databases
- Web development tools
- High-end digital video
- Streaming media
- Virtual laboratories
- Visualization and interactive 3D modeling

TRACK 3 - IT IMPLEMENTATION AND SUPPORT

Successful implementations of technology include evaluation and support strategies, along with planning for integration with enterprise systems. This track shows what institutions are doing to support faculty development, evaluate technology programs, provide help desk services, and offer resources for technology integration.

- Help desk and technology support services
- Learning technology groups
- Technology program evaluation
- Faculty development and support
- Learning objects and open resources
- Standards and open source
- Web integration
- Web services technologies
- Managing Web-based content resources
- Web search tools
- Digital libraries
- Information repositories and data exchange

TRACK 4 - STRATEGIC PLANNING/ ADMINISTRATIVE ISSUES

Strategic planning may involve a myriad of challenges, from infrastructure issues, to accreditation of distance learning programs, to section 508 compliance. Concerns may include how to determine return on technology investment, or how to plan for current and future waves of technology, portals, and learning management systems.

- Technology infrastructure and IT planning
- Student administration systems
- Online student services
- Course management systems/learning management systems
- Accreditation of distance learning programs
- Accessible information technology
- Content management systems
- Campus portals
- Faculty support and rewards
- eCommerce
- Security for campus environments
- Intellectual property issues
- Globalization of .edu: policies and practices

TRACK 5 - TEACHING WITH TECHNOLOGY

This track offers a faculty view of the intersection of technology and pedagogy. Join colleagues as they discuss new models of learning, present case studies in their disciplines, and explore relevant topics including instructional design standards, technology and student learning, and more.

- Technology and pedagogy
- Instructional design standards
- Technology and student learning
- Student assessment practices
- Teaching studio courses online
- Student technology assistants
- Teaching in new technology environments
- Interactive teaching modules
- Automating feedback to students
- Online student/faculty communications
- Online course content resources
- Curriculum redesign

HOW TO SUBMIT A PROPOSAL

Interested parties are invited to submit proposals via e-mail per the following instructions. All relevant proposals will be considered. The final date for submission is January 5, 2004. Notifications of acceptance will be made by February 1, 2004. Due to a large volume of proposals and multiple submissions, you will receive notification upon receipt and also upon the *acceptance* of your proposed session only.

Please note: As a condition of acceptance, each presenter will be required to submit, by Friday, April 2, 2004, a 1,000- to 1,500-word article for consideration for publication in the conference proceedings on the Syllabus Web site or in ***Syllabus*** magazine.

FULL -AND HALF-DAY WORKSHOPS

(3-6 hours)
Classroom style, in-depth workshops that explore the hows and whys of technology implementation in the subject areas of the tracks.

BREAKOUT SESSIONS

(1-1.5 hours)
Presentations that introduce a technology, program, or pedagogical strategy as well as the issues and benefits of implementation in the higher education environment.

PANEL SESSIONS

(1-1.5 hours)
Plenary sessions with a group of speakers and a moderator brought together for a discussion or debate of topics selected from the conference tracks.

TECHNOLOGY APPLICATION CASE STUDIES

(1-1.5 hours)
These sessions are focused on practical case studies of technology applications and integration in higher education. This is an opportunity for all those involved in IT implementation and operations – faculty, administrators, and technologists – to share their experiences with implementation teams from other campuses. These sessions should be issues/results-focused in line with the conference tracks.

POSTER SESSIONS

A detailed look at graphic presentations and papers posted in designated areas. Poster presenters will be on hand for informal discussion at designated session times.

SUBMISSIONS SHOULD INCLUDE THE FOLLOWING INFORMATION:

I. The title of the presentation
II. The proposed format, e.g., breakout session (see session types, above)
III. An abstract of the presentation content (600 words or less)
IV. An indication of the conference track(s) into which your topic would most likely fall
V. A brief session description suitable for publication (one 75-word paragraph)
VI. Name and academic title (e.g., Ph.D. or Ed.D.) for each presenter
VII. E-mail address and phone number for each presenter (please include both home and office phone numbers)
VIII. Presenter bio(s) suitable for publication (one 75-word paragraph each – be sure to include current position and affiliation)
IX. Any further information that might be helpful in determining the relevance of your topic to the conference

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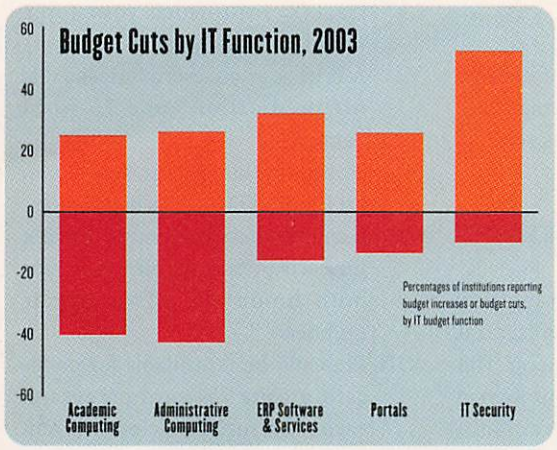
Thank you for your proposal. For questions pertinent to your submission, please call Jim Turner at (818) 734-1520 x217 or e-mail jturner@101com.com.

Digital Puck, *continued from page 13*

compared to half (50.7 percent) of public universities and 47.2 percent of community colleges.

Similarly, the 2003 survey data also reveal a downturn in spending on administrative computing. As above, two-fifths (42.3 percent) of the 2003 survey respondents report a decline in the campus budget for administrative computing, compared to almost one-third (31.0 percent) in 2002, one-fifth (18.3 percent) in 2001 and one-eighth (11.7 percent) in 2000.

Another indicator of troubled technology funding is the growing number of campuses reporting mid-year budget cuts. Fully one-third (32.4 percent) of 2003 survey participants report mid-year budgets cuts this past year, up from a fifth in 2002, 8.0 percent in 2001, and 5.3 percent in 2000. The mid-year budget rescissions averaged 9.2 percent in A/Y 2003, compared to 7.0 percent in A/Y 2002.



Yet the survey data also reveal some interesting funding priorities amidst the budget cuts. For example, even as overall funding for computing declines, campuses are increasing budgets for portals, ERP software/services, and IT security initiatives. These increases in specific lines—security, portals, and ERP services—come at the expense of other portions of already reduced IT budgets, often equipment and consulting services.

Although the majority of survey respondents seem somewhat optimistic that budget cuts will not have dire consequences for key technology initiatives on their campuses, many IT officials are clearly concerned. Almost a third (33.3 percent) "agree/strongly agree" that budget cuts will "severely impede efforts to enhance eLearning" and just over one-fourth (29.7 percent) "agree/strongly agree" that budget cuts will "severely impede/interrupt ERP upgrade/replacement efforts." One fifth (21.8 percent) of the institutions participating in the 2003 survey report delaying or deferring ERP deployments, replacement, or upgrades.

Taken together, these data and other information from the 2003 Campus Computing Survey reflect the movements of a digital puck that is going, concurrently, in many directions: a continuing campus concern for instruction and the instructional infrastructure, a new focus on administrative systems, and real, long-term pressures on technology budgets and resources.

Unfortunately, the inherent (and now continuing) tension between rising expectations for IT-enhanced instructional resources and administrative services and reduced funding for IT budgets ultimately affects students who come to campus to learn about and also to learn with technology. The recession manta, again heard on many college campuses—do more with less, and do it better—makes for an interesting sound bite but fails to provide a clear path or a strategic plan for IT resources, services, and operations.

[***Editor's note:*** Visit Casey Green's new Digital Tweed Blog on www.syllabus.com/blog.]

***Casey Green, Ph.D. (cgreen@campuscomputing.net)**, founding director of The Campus Computing Project (www.campuscomputing.net), is a visiting scholar at The Claremont Graduate University and a visiting professor at Case Western Reserve University.*

Trends, *continued from page 8*

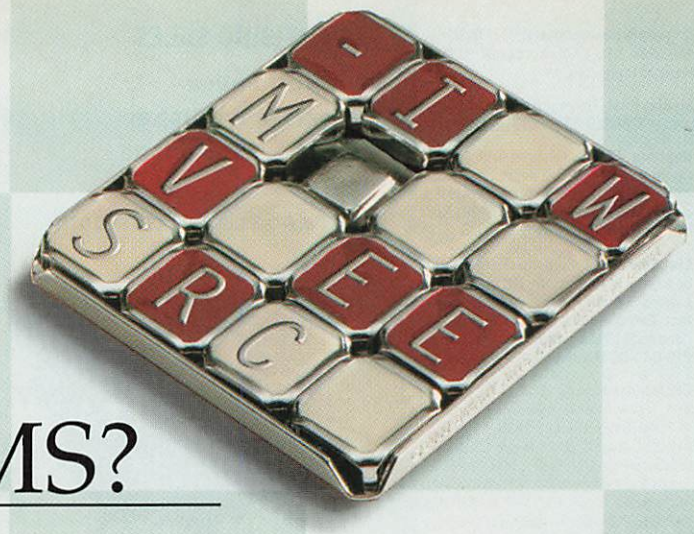
You've got an hour to get through four presentation teams showing their work. The first team came early to connect and try things out. The others did, too. But you can only leave one connected at time (let's assume you don't have a multi-port video routing switch for the moment—that's only a partial solution to this scenario, anyway). The first team finishes up brilliantly on time at 12 after the hour. Team Two, waiting in the wings, jumps up and now the laptop-switch dance begins in earnest.

Unscrew the video port bolts, tightened down by an eager Team One helper until they nearly require the jaws of life to separate them. Attach laptop two... tension rises as the students search for the proper two-finger salute to redirect the video from the screen out to the projector. Was it <SHIFT> <9>? <CTRL> <7>? <F7>? Finally, after an eternity (about a second and a half on average, if you know the magic sequence) the screen flickers to an image that is...unreadable!

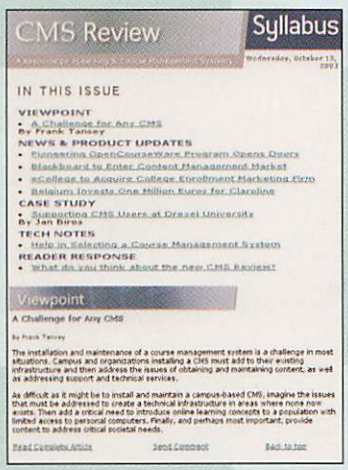
Why can't you just drag your presentation file onto the icon of the display device and see it 'appear' in living color on the screen? Remember this digression started with decomposing the IP addressability and connection conundrum. I'm still there. The newest crop of display device/white board/capture tools has added a Web server in the board. Yup, the white board now has an IP address because it has a PC with a Web server (along with needing power and data connections to work). What does that mean? You can convert your presentation to an HTML file set, for example by using FTP, wirelessly to the white board display. Voila!

I'm out of space, though I wanted to comment on batteries, software, and changing landscape of how educational tools are designed and built. We'll continue this in the next issue of *Syllabus*—in January 2004!

***Phil Long, Ph.D. (longpd@mindspring.com)** is senior strategist for the Academic Computing Enterprise at MIT. He is also a senior associate for the TLT Group of the AAHE.*



Puzzled by CMS?


CMS Review

Syllabus

Wednesday, October 15, 2003

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Viewpoint

A Challenge for Any CMS

By Frank Tansey

The installation and maintenance of a course management system is a challenge in most situations. Campus and organizations installing a CMS must add to their existing infrastructure and then address the issues of obtaining and maintaining content, as well as addressing support and technical services.

As difficult as it might be to install and maintain a campus-based CMS, imagine the issues that must be addressed to create a technical infrastructure in areas where none now exists. Then add a critical need to introduce online learning concepts to a population with limited access to personal computers. Finally, and perhaps most important, provide content to address critical societal needs.

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Course Management Systems. The complexity is as significant as the payoff. That's why Syllabus has launched CMS Review, a new biweekly e-newsletter focused specifically on e-Learning . . . its technology and implementation.

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12.5 inches, the aspect ratio and size of a 14-inch HD TV. It scrolls up to the thickness of a pencil, and with its pen clip, one can keep a few of them in a shirt pocket or toss them in a purse. One version unscrolls into a cylinder that wraps around your head to give an out of this world virtual reality experience.

Another technology, the Direct Vision screen, creates a heads up display on specially equipped eyeglasses or contact lenses. All in all, this cornucopia of new screen technologies at last gives small devices access to large screens.

The Information Summarizer

Although MS Word has had a summarize function for years (see AutoSummarize under Tools). We now have a more powerful tool integrated into our office tools, Web browsers, news watchers, and search engines. With the Information Summarizer you can view summaries of news, memos, documents, and Web sites condensed to any degree before investing the time to read the unabridged versions.

Channelized Portal Information

This year, we've seen major applications offered in which the sole user interface is via a portal. News services, financial applications, and self-service applications are appearing as portal channels or portlets instead of as independent Web pages. The foresighted pioneers who created enterprise portals now have a wealth of channelized information with which to populate them.

Simulations

MESA—the Multidisciplinary Educational Simulation Archive has finally gotten off the ground after a rocky start. You'll recall that MESA is a large consortium of colleges and universities that are building reusable sharable simulations that are as easy to include in a Web site as an image. These simulations all allow customization by just checking a few boxes and selecting a few pull-down menus. Faculty members are starting to add impressive simulations to online course material that they are building themselves now that the MESA library has several hundred offerings.

The NEC Fuel Cell Battery

While discussing the Neutrino Plus chip, I mentioned a fuel cell battery that ran for many hours on a fill up of methanol fuel. This sounds at least as unlikely as the other future products reviewed here, but before dismissing any of them you should know that NEC has already demonstrated a prototype notebook PC powered by such a battery. While no one can reliably predict the future, by trying to do so we gain the opportunity to influence what it will be. Just a few years ago some of the things we take for granted today would have seemed like magic. Besides getting the payroll out and getting the e-mail through, one vital job we all have in IT is to ensure that the magic continues.

Howard Strauss (howard@princeton.edu) *is the manager of technology outreach at Princeton University.*

Howard Strauss

REFLECTIONS

ANOTHER LOOK AT EDUCATION TECHNOLOGY

The Best IT Products of 2007

Why wait four years to read these reviews when you can read them right now? Check out a few of the best products of 2007 before they are invented.

Variable Iconic Keyboard (VIK)

At last, a keyboard that can display information as well as enter it. While I proposed this in 1987 [www.princeton.edu/~howard/pie/pie.htm] it took 20 years for someone to finally build it, but the VIK is a wonderful product that changes the way we use keyboards.

Each key of the Variable Iconic Keyboard is actually an LCD display that defaults to standard QWERTY format. In use, the symbol or icon displayed on each key depends upon the font and function selected. When entering Greek prose, Greek letters appear on the keys. When entering chemical equations the keys display chemical symbols. For music, equations, Chinese, or any other special input, the keyboard displays appropriate symbols. Function keys, escape keys, cloverleaf keys, and other special keys are gone, replaced by a group of general purpose keys and keys otherwise unused at the moment that display in-context icons for just those functions that are available at any moment. For simple things such as multiple-choice questions, the keyboard only displays the possible choices (the other keys display nothing). And of course it is programmable so that any software can use it to display whatever symbol or customized icon seems best. Sure, you can still use those pictures of keyboards on your screen and you can try to remember the keyboard short cuts, but how much nicer it is to press a key that says *Refresh* than to remember which function key does that. Most of those tablet PCs now include a Variable Iconic keyboard.

The Neutrino Plus Chip

The Neutrino Plus chip finally makes real mobile computing available. Of course it is a super-low power chip that uses a fuel cell battery that lasts 170 hours [www.nec.co.jp/press/en/0309/1701.html] or so per fill up in a laptop, but it is also compatible with *all* mobile formats—Bluetooth, cell (CDMA, TDMA, GSM, GPRS, and UWB), Wi-Fi (802.11a thru k), the walkie-talkie standards (FRS and GMRS), and others. The chip is software upgradeable to adapt to future mobile standards. Now you can use your laptop, PDA, or other intelligent mobile device everywhere. The Neutrino Plus chip switches to the least expensive connection having appropriate quality as one moves from place to place.

The Plus in the Neutrino Plus chip is its inclusion of an FM, XM tuner/receiver plus a 3-inch satellite TV dish. While you can poke around on the net to find creaky Web radio and TV broadcasts, with Neutrino Plus you can just tune the chip to NPR, CNN, HBO, or anything you can get from a radio, TV, or satellite. The tuners are integrated into mobile devices so that you can search on broadcasts by topic, artist, time, or other features, and when copyright allows, broadcasts can be saved for replay, editing, or e-mail attachments.

Screen Breakthroughs

The year 2007 has seen many advances in screen technology, especially for devices, such as PDAs, cell phones, watches, and intelligent jewelry that have small screens. The Origami Display Device uses a unique folding screen that unfolds from a tiny ornamental butterfly or dragon to a screen a square foot or larger, then snaps back automatically. ODDs in the shape of small squares or polygons are also available. The new Rotoli Reali scrolling screen uses quite a different approach to packaging a large screen in a small package. A typical Rotoli Reali is about 7 inches long and unscrolls to

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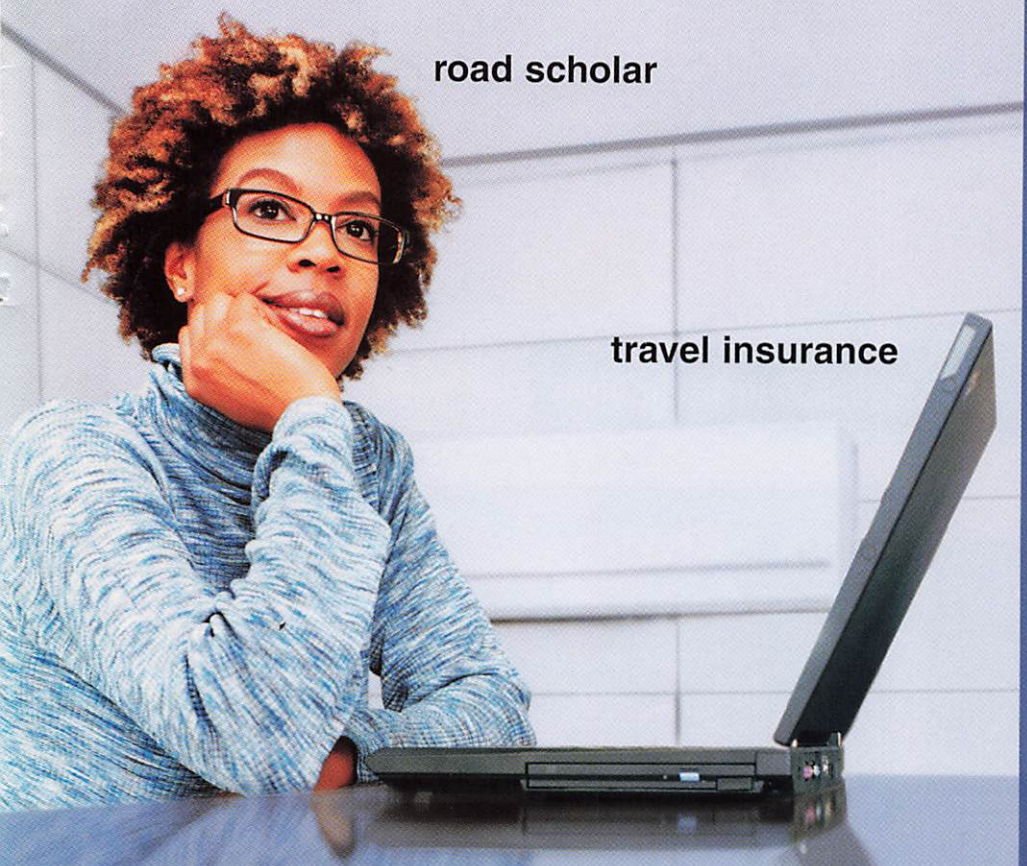

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